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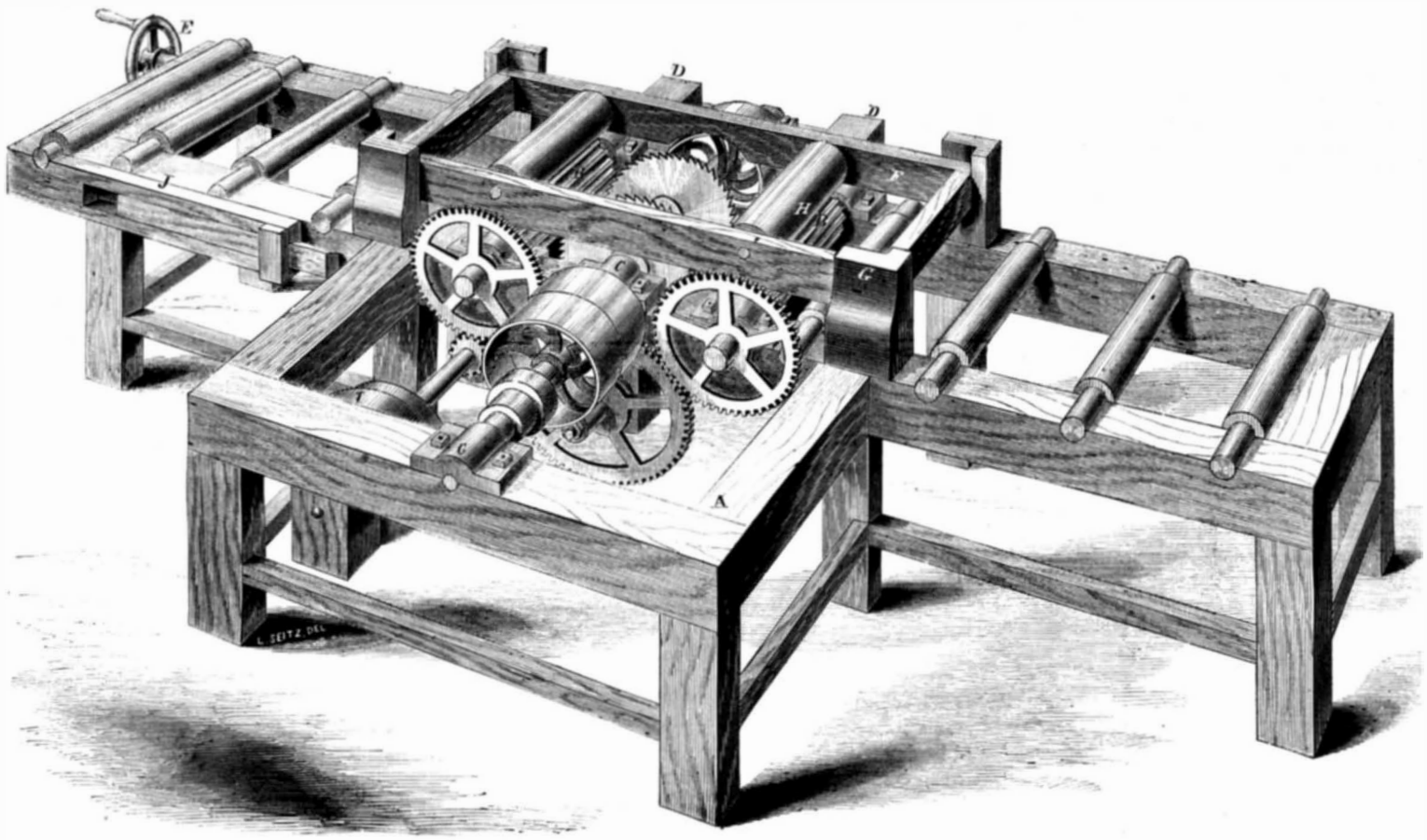
Improved Lumber Edging Machine.

The machine illustrated herewith is intended for trimming or edging planking or lumber of anykind, and is simply and conveniently arranged for that purpose. The principal parts are the wooden frame A, the fluted rollers, B, by which the timber is brought towards the saws and the gearing by which these rollers are driven. The saw mandrels run in the bearings C, the one in the foreground of the engraving is stationary, while the other saw is fitted in a frame which cannot be shown plainly, as it is hidden by the other parts of the machine. This saw frame slides between the guides or ways D, D, and the frame itself is moved in or out to suit various widths of lumber by the crank E. This crank turns a shaft upon which a pinion is keyed; the pinion gears into a rack upon the under side of the sliding frame the saw sets in, so that by turning the wheel the saw is advanced towards, or withdrawn from its fellow opposite; thus graduating the width of the planking cut with great accuracy. There may also be an index, or scale of feet and inches attached to this machine upon the sliding ways D, so that the saws can be quickly adjusted to cut timber of any width.

Directly over the fluted rollers, B, there is a rectangular frame, F, which rises and falls in the guides, G; this frame is furnished with two other rolls, H, which are perfectly smooth and directly over the fluted rolls; when the timber to be cut is inserted at one end of the machine it is seized by these fluted rollers, and they, in connection with the self-adjusting frame and rollers just mentioned, feed it steadily through the machine, no matter what the thickness of the stuff is. By this arrangement the work may proceed whether the timber is all of one lot or not, which is a material advantage to the manufacturer.

The gearing which operates the rollers is driven by a belt on the pulley, I. One end of the main frame, A, has an extension piece, J, added to it. This is supported by brackets, as shown. The shaft on which the crank wheel, E, is fixed has a tubular sleeve to accomodate this extension, so that when it is drawn out, the shaft will operate as before—a very useful attachment when long timber has to be sawed. This mill will answer the purpose it was intended for well, and was patented by L. A. Ensworth and B. Barker, of Williamsport, Pa., on Jan. 27th, 1863. Further information can be had by addressing B. Barker, at 105 East 22d street, New York.



ENSWORTH & BARKER'S LUMBER EDGING MACHINE.

Air and Ocean.—Interesting Items.—The air is made up of a mixture of two gases, oxygen and nitrogen, and it always contains considerable watery vapor and carbonic acid. In his new work on chemistry, Prof. Youmans states that if all the air were reduced to its average density at the earth's surface, it would extend about five miles high, and that if the above constituents were arranged in layers one over the other, we should have first, at the bottom, a bed of water all over the earth's surface 5 inches deep; next a layer of carbonic acid 13 feet deep; next above, a layer of oxygen gas about 1 mile deep; and above this a layer of nitrogen gas about 4 miles deep. This will help the memory. Sea water contains about 4 ounces of salt in every gallon. Estimating the ocean to average two miles in depth, the salt, if separated in a solid bed, would line the bottom of the entire ocean to a depth of 140 feet.

Mr. Bessemer, the inventor of the process of converting iron quickly into steel, now says he can produce a block of it, twenty tuns in weight, from flint cast iron, in twenty minutes!

Great Railway Bridge.

The new bridge now being built on the railway route leading from New York to Washington, across the Susquehanna river, at Havre de Grace, will be 3,800 feet long, and supported by 13 stone piers, each 240 feet apart; seven of these will have pile foundations and six rock. They will be constructed so as to resist the greatest pressure of ice which it is possible to bring against them. The greatest depth of water in which these piers are laid is 42 feet. The bridge will have a "draw" on the pivot plan, with two openings of 70 feet each in width. The railway track will be twenty-five feet from the water; above that will be a common carriage-way. The entire hight of the bridge will be 50 feet, its estimated cost $700,000. It was intended to build the superstructure of iron, but the high price of that material may cause the substitution of wood.

Cleanness of Gun-cotton.—In their report to the Austrian Government, the Commission appointed to examine gun-cotton say:—"From the steel barrel of a rifle, 40 rounds have been fired with gun cotton cartridges, which have hit the target 300 yards distant, in an unexceptionable manner. After the said number of rounds, the barrel was internally as clean and polished as a mirror."

A Maine paper says:—"People are getting into the habit of using sirups as a substitute for butter. It is found easier to contract such a habit than to form the habit of paying fifty cents a pound for butter. Many of the boarding houses find it impossible to procure butter. One of the grocers sent a runner one hundred miles into the country for butter, and succeeded only in obtaining one tub."

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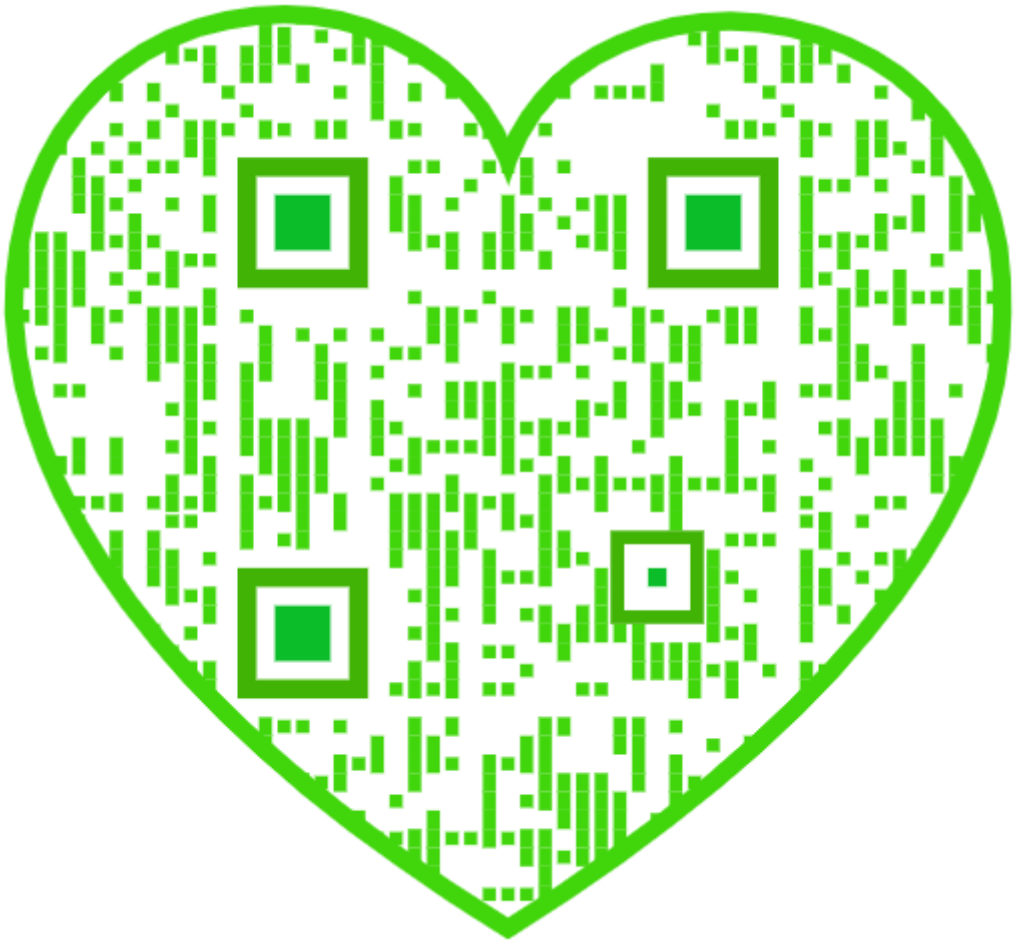

THE MOST IMPORTANT AMERICAN DISCOVERIES AND INVENTIONS.

No. 5.

LATHE FOR IRREGULAR FORMS.

Blanchard.—1818.

There are two classes of inventions—those of one class, like the steam engine, are the product of a long series of suggestions by different intellects, while those of the other class are each the bold conception of a single mind. Nothing could appear more impossible to most persons than the construction of a machine which should carve, from an irregular block of wood, a gun stock or a bust of the exact size and form of a pattern placed in the machine, and yet nothing could be more simple than the plan by which it is effected.

This machine was invented by Thomas Blanchard, of Sutton, Mass., and was suggested to his mind under the following circumstances. He had invented a tack-making machine and sold the right for $5,000, when a friend induced him to undertake the task of devising a machine for turning gun barrels to supersede the laborious and imperfect method then in use of reducing them to a uniform thickness by grinding. The barrel was required to be cylindrical, excepting about three inches at the breech, which had two flat and oval sides. Mr. Blanchard constructed a lathe which formed the barrel at one continuous operation. The tool commenced at the muzzle and turned the round part of the barrel in the usual manner, and when it reached the proper point near the breech, it received a vibratory motion from a cam in the arbor by which the required form was produced in the most perfect manner.

The Superintendent of the U. S. Armory at Springfield made a contract with the inventor to erect one of his machines at that establishment, and when it was put in operation, the workmen gathered round to see it work. When the finished barrel was taken from the lathe one of the men remarked to another:

"Well John, he has spoiled your job."

To this one of the carvers of musket-stocks responded:

"He can't spoil mine. I'll defy him to turn a gun-stock."

This remark impressed Blanchard forcibly, and he thoughtfully replied:

"I am not so sure of that, and will think it over."

On his way home, a few days afterward, as he was slowly riding over the hilly roads of Brimfield, wrapt in deep meditation, the plan for turning irregular forms suddenly burst upon his mind, and he exclaimed aloud—

"I have got it! I have got it!"

Two men by the road-side, whom he had not perceived, overheard the exclamation, and one of them said to the other—

"I guess that man is crazy."

In this machine the cutters are secured in the periphery of a rapidly revolving wheel, and the block to be carved is suspended in a swinging frame upon a shaft parallel with that of the cutter wheel. The pattern is fastened upon the same shaft, and rests against a rod or wheel on the shaft of the cutter wheel. The shaft bearing the pattern and block is made to revolve slowly; and the pattern resting against its guide causes the frame to swing out or in so that a ring is cut in the block of the same form as that part of the pattern which rests against the guide. The cutter-wheel and guide are carried along by a slow rectilinear motion, from one end of the pattern to the other, and thus the block is carved into exact conformity with the pattern.

This machine has come into general use for making lasts, spokes, hat-blocks, wig-blocks, and numerous other articles. It will make both a right and left last from the same pattern, in one case the pattern being turned in the opposite direction from the block. By a simple adjustment, too, lasts may be varied either in size or length from the pattern. We are not acquainted with any other piece of mechanism which produces so many and so varied results by so simple means.

THERE is a tenement-house in this city having sixty-eight rooms, eight by ten feet, containing seventy families of one hundred and forty-four adults, and one hundred and thirty-eight children, eleven dogs, and forty-three cats.

Hints to Riflemen.

If a man travels from the north-east corner of Maine to the south-west corner of Texas, he will find that the inhabitants of nearly all the places are impressed with the conviction that their own particular town contains a body of rifle-shooters superior to any others in the country or in the world. There seems to be no other art or amusement which commands so general an interest in the community as this. It is therefore probable that a treatise upon it, containing original and valuable matter, will have a wide circulation. We have just received from D. Appleton & Co., of New York, a neat little book of 260 pages, entitled "Hints to Riflemen," by H. W. S. Cleveland, an old sportsman who has had a great deal of experience in the use of the rifle, and who writes upon the subject with intelligence and good sense. We make the following extracts because they give a good idea of the work, and also because they are as attractive reading as anything with which we can fill our columns :—

THE BEST TARGET RIFLE.

"The conditions whose observance is essential to the utmost perfection of accuracy and power, are more rigidly adhered to in the construction of the American target rifle than in any other which has yet been produced, and their fulfilment has resulted in a weapon, which, *in these qualities*, has never been, and probably never can be, surpassed. These conditions are: first, an enormous weight of barrel, admitting the use of so heavy a charge of powder as to impart the greatest possible initial velocity to the ball without any serious recoil; second, the gaining twist, which is absolutely essential to prevent stripping when so heavy a charge is used; third, the patent muzzle for loading, which with the help of the 'starter,' insures the accurate insertion and true delivery of the picket; and, finally, the telescopic sight, which renders the aim mathematically exact."

REPEATERS FOR SPORTSMEN.

"The service for which I have thus far had occasion to use the rifle, has been solely in shooting large game mostly in stalking deer. A somewhat extended expeperience of camp life on the prairies and in the woods, in exploring and surveying wild tracts, as well as on expeditions undertaken expressly for sporting purposes, has taught me the importance of economizing the number and weight of my equipments to the utmost possible degree—the number, because every additional article increases the danger of leaving behind or losing some implement which may be essential to the success of the expedition; and the weight, for reasons which make themselves obvious at an early stage of the march. If one goes on a mere gipsying excursion with abundant means of transportation, he may of course provide himself with whatever luxuries he may deem essential to comfort; but to my mind the zest of a life in the woods consists in securing the greatest possible liberty of locomotion, and relying, so far as may be, upon the products of the chase for subsistence. I have lived for months in the woods, carrying no other provisions than pork, hard bread, and tea, my whole kitchen furniture consisting of a knife and a tin cup, and my chief dependence being upon game roasted upon a stick, or fish wrapped in leaves, and baked in a hole in the ground. Two or three men may easily carry enough of such provisions by team, or in a canoe or bateau, to last for months, and on reaching their field of operations, may deposit them in a 'home camp,' and thence go out on their hunting trips, carrying a week's provisions if they wish in their knapsacks. Six crackers of common 'pilot bread' are enough for a day's allowance, and five pounds of salt pork should last a week, though this of course will depend upon the game secured. In surveying, when I have had no time to look for game, I have lived for weeks together upon no other food than this, frizzling my slices of pork upon a stick held over the fire. A small piece of fresh meat may be cooked in the same way, being skewered between two slices of pork, which will salt it sufficiently and prevent its being smoked. A very small quantity of tea will last a long time, and may be made by steeping in water boiled in the tin cup. Sugar is an unnecessary luxury which no one will ever return to, who has once accustomed himself to do without it.

"To correspond with the requirements of such service the gun should be as light as is consistent with efficiency, and requiring the least possible incumbrance in the shape of ammunition and equipments. It is obvious, therefore, that the caliber of the gun becomes a matter of vital importance, since a slight addition to the weight of the ball will make a very sensible increase of the load to be carried, when one is taking a full supply. If there is a probability of meeting game which may prove dangerous when wounded, as a bear or a moose, one would feel safer if armed with a weapon which would enable him to deposit an ounce of lead in his carcass. But in order to get the full benefit of so heavy a ball, the weight of the gun must be increased proportionally, and it becomes necessary, therefore, to carry an enormous weight of gun and ammunition in order to be prepared for merely possible emergencies, while for all other service a very much less weight is all-sufficient. It is better, however, to submit to such inconvenience, disagreeable as it may be, than to run the risk of exposure to the alternative of a conflict with an enraged beast with no time to reload. But the necessity of carrying such a load may be obviated by using a repeater, carrying a ball of half the weight, for it is hardly conceivable that any animal may not be stopped by a man armed with a six-shooter. Indeed any of the single shooting metallic cartridge guns might be reloaded in time for a second or perhaps a third shot, which ought to be enough to finish the work in the hands of a man of sufficient nerve to think only of his aim. Excepting for such an occasion as this, or the more probable one of coming upon two or three deer together, or requiring a spare shot to prevent a wounded animal from escaping, there is no advantage to the sportsman from being able to load and fire very rapidly, and he may be hunting a long time without ever meeting an adventure for which a muzzle-loader would not be all sufficient. But if he ever happens to find himself in either of the above supposed positions, he will feel (if he has any of the spirit of a sportsman) that he never before had so keen a sense of the value of time; then it is, that the few seconds more or less, required for the manipulations between the shots, become matters of vital moment. Then he will learn, if he never did before, the importance of being so familiar with those manipulations that he goes through with them instinctively, and without taking his eye off his game; and then it is that the slightest sticking of any part or misplacement, or delay of even a single moment, becomes in his eyes a misfortune whose magnitude cannot be measured by ordinary standards."

EFFICIENCY OF BREECH-LOADERS.

"Capt. Wilson, Co. M, 12th Kentucky Cavalry, is an unconditional Union man, living in a strongly disloyal section of Kentucky. His neighbors had threatened his life. In consequence of this, Capt. Wilson had fitted up a long crib across the road from his front door as a sort of arsenal, where he had his Henry rifle, Colt's revolver, &c. One day, while at home, dining with his family, seven mounted guerillas rode up, dismounted and burst into his dining room, and commenced firing upon him with revolvers. The attack was so sudden that the first shot struck a glass of water his wife was raising to her lips, breaking the glass. Several other shots were fired without effect, when Capt. Wilson sprang to his feet, exclaiming, 'For God's sake, gentlemen, if you wish to murder me, do not do it at my own table in presence of my family.' This caused a parley, resulting in their consent that he might go out doors to be shot. The moment he reached his front door he sprang for his cover, and his assailants commenced firing at him. Several shots passed through his hat, and more through his clothing, but none took effect upon his person. He thus reached his cover and seized his Henry rifle, turned upon his foes, and in five shots killed five of them; the other two sprung for their horses. As the sixth man threw his hand over the pommel of his saddle, the sixth shot took off four of his fingers; notwithstanding this he got into his saddle, but the seventh shot killed him; then starting out, Capt. Wilson killed the seventh man with the eighth shot. In consequence of this feat the State of Kentucky armed his company with the Henry rifle."

A NEW "wrinkle" in the gas business is an attachment of a small marine clock to street lamps, whereby the gas is turned off at precisely the moment desired. An arrangement of this kind has been applied to a lamp in Springfield, N. J., and so far it works to a charm, and only needs to light the lamps to be perfect.

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A GLANCE AT THE METROPOLITAN SANITARY FAIR.

In our estimation, the people of this city have never witnessed such an exposition of valuable merchandise as that which was formally opened on the 4th of April last, and known as the "Great Metropolitan Fair." We are not alone in this opinion, and if we required backers to aid us in maintaining it we are very certain they could be found in great numbers.

The only fair that approaches it was held in the Crystal Palace; but that extended over a much larger area, was the united product of the skill and cunning of the whole world, and occupied much more time in its general arrangement and plan than our "Sanitary Fair." One fairly realizes the fables of olden times in contemplating the exterior and interior of those beautiful buildings, for, within a comparatively short time have been gathered in the most splendid and valuable assortment of works of art, of every description that it is possible to conceive of. Jewels, rare stuffs, silks, velvets, costly china and glass, vases of great value that might stand by the thrones of monarchs, richly decorated time-pieces, skillfully contrived machinery, these are but a small part of the contents of those buildings. The individual contributions have been lavish without precedent. In five days, the average receipts from all sources, were between $50,000 and $100,000 daily; at this rate the aggregate amount will be enormous, and the comforts it will bring to the sick and wounded soldiers, for whose benefit this magnificent gift was planned and carried out, will show them conclusively that they are not forgotten. We cannot give a detailed description of all the various stands and the contents of them, as it would absorb more space than we have at our disposal. The mere recital of the attractions would have but little more interest than an auctioneer's catalogue, but there are some novelties which cannot be passed so unceremoniously.

THE MACHINERY DEPARTMENT.

A sketch of some of the objects in the "Machinery Department" will, we presume, be interesting to most of our readers; and we have taken some pains to examine it in detail. The first thing that arrests the visitor's attention on entering at the upper door is a large horizontal steam engine very plainly finished; this is contributed by the owners of the yacht *Clara Clarita*, in which vessel it was placed for the purpose of driving her; it was found too small for the work and is to be supplanted by two others. Directly below this machine is the now celebrated—

ROOT'S ENGINE.

We gave a full description and detailed illustrations of this remarkable steam engine on page 193, current volume of the SCIENTIFIC AMERICAN, and we have from time to time alluded to it in other paragraphs not only as an act of simple justice to an ingenious inventor, but with the object of bringing before the public one of the most remarkable and useful machines ever moved by steam. Some novel steam engines have been illustrated in past volumes of the SCIENTIFIC AMERICAN, but we never before saw so complete a realization of the force of steam power in the same space. Mr. Root has five engines of his invention at the fair, one of which drives the whole line of shafting in the building; attached to the shafting are several machines of one sort and another, which will be alluded to hereafter. The steam gage indicated but $2\frac{1}{2}$ pounds pressure to the square inch, when this little engine (it stands in about two square feet) was running 150 revolutions per minute, without noise or rattle of any kind, and we are assured that half a pound is sufficient to overcome the friction. One of these engines is exhibited with the bonnet or cylinder head removed, so that visitors can see the internal arrangement; the engine attracts a great many by reason of its simplicity and ease of action. Just below this stand may be seen a pair of—

ANDREW'S DOUBLE OSCILLATING ENGINES.

These are highly finished machines and are connected to work on the same crank at an angle of 45°. They run very rapidly and noiselessly, and are remarkable for their freedom from complexity, being without eccentrics, valve rods, links, or other attachments for admitting steam to the piston. This duty is performed in an accurate manner by the oscillation of the cylinders. The steam chest is placed beneath the cylinder so that the wear of the trunnions is always towards the working faces, thus tending to keep the joint tight. These engines are also exceedingly compact and large numbers of them are made and sold annually.

In the "New Jersey Department," Mr. Reid exhibits one of his horizontal oscillating engines, which also admits the steam without the use of valves; the cylinder vibrating between steam chests having ports at the sides for the entrance of the vapor; the one now on exhibition works very well. Some other small steam engines were also in this department, but they had no novelties or new principles about them; one small model of a horizontal engine was in working order, and attracted much attention from youths and others; it was well made and was in its way an interesting sight.

A MAGNIFICENT FOOT LATHE.

This lathe made by Schenck of this city, and presented by Colwell and Bros., iron founders, foot of 27th street (N. R.), is the most complete tool of the kind we ever saw. The workmanship is elaborate and in addition to the usual fixtures it has an index plate fastened on the main spindle fitted with all the appurtenances needed to cut gear wheels of quite a large size. Boring tools of many different standard sizes, and of a peculiar pattern, accompanied the lathe as also did a quantity of chucks, drills, and tools of all sorts. Mr. J. B. Root, who exhibits the engine spoken of previously, has purchased this lathe for $600, and it was cheap at that price, as it has a "slide rest" capable of moving in any direction, change wheels for cutting screws, and also an apparatus for centering work.

THE FLAX-DRESSING MACHINE.

The flax-dressing machine of Mallory & Sandford occupies a prominent position at the fair. We cannot say anything which will add to the value of this machine, or the estimation it is held in. Great bunches of long unbroken flax fiber, both rotted and unrotted, free from shoove or fragments of it, attested its utility for its class of work, and we are pleased to know that the orders of the makers are large. A number of other small machines occupy the attention of visitors, but we cannot enumerate them all. Wilcox and Gibb's sewing machine was shown driven by power and running at the rate, (so the operator informed us) of 2,000 stitches per minute! Messrs. Hoe exhibit one of their small cylinder-presses, and near by it there is another machine without name or label upon it to show its use, or inform visitors what it is intended for.

ROPER'S HOT-AIR ENGINE.

This engine is at the lower end of the room and is most of the time—working rapidly and powerfully. Many of these engines are now in use in this city and elsewhere. From what we have seen of them in operation they seem well adapted to all purposes where only a small power is required. These engines, it will be borne in mind, are driven by heated common air, and do not require boilers or vapor, derived from any source. They are said to be exceedingly economical of fuel and repair, and require little attention while running. It was stated that this engine was intended to drive one of Hoe's small presses, and print the newspaper which is published at the fair; probably this will be done before the exhibition closes.

DUDGEON'S STEAM HAMMER.

This hammer is exhibited in action, and two small lads handle one of these machines with great skill; a block of wood does duty for a bar of iron, and the force of the blow which can be given is shown literally in a "striking" manner. The hammer descends swiftly or gently as the steam (admitted by the attendants) is great or small in quantity.

STEAM PUMPS.

There are a variety of these useful machines, the most notable of which are those of Condict and Stevens, of Jersey City, and Mr. William Sewell. The first of these two is very compact in design, and has a novel valve gear, whereby the main piston, aided by a long arm attached to it, moves the valve for the admission of steam at each stroke. There are also other details in connection with the valve through which the steam is made to act directly on it, and to aid in operating it. This pump works rapidly and without noise; it is highly approved of by those using it. Sewell's pump is different in its design and construction, and is capable of being used for a donkey engine to pump up the boilers on board ship, for hoisting ashes or freight out of the hold, disconnecting heavy parts of the main engine—in short, for a variety of purposes. It is also arranged in such a way that the steam piston can be detached from the water piston directly opposite it, and the latter can be worked by hand; thus rendering it quite as efficient, through the agency of firemen, when there is no steam in the boilers.

THE SHIP-BUILDING DEPARTMENT.

In the "Ship-building Department" we found a number of attractive objects. Some highly finished brass work made by Messrs. E. Hidden, of this city, and intended for the Italian frigate *Re Don Luigi di Portugallo*, drew much attention as did also the various models of ocean steamers and sailing vessels.

BARNUM'S SELF-SEWER.

This article attracted much notice from the ladies and others interested in sewing machines; it is really a useful and novel instrument. It guides the cloth or other material to be sewed so that it is unnecessary to use the hands or eyes after the fabric is once adjusted. The operator may merely "work the treadle and, aside from that, do anything else that he or she chooses; read, whistle, sing or employ any other means for drowning dull care." The name is a detriment to the article, as it gives no idea whatever of its scope or purpose.

MISCELLANEOUS OBJECTS.

In the way of small wares there are in the outer rooms an unusual variety of great excellence and value. Brady's patent skate is shown by the N. Y. Skating Club; these skates were either very heavily plated or else made of solid silver—we could not tell which. They are highly ornamented, and the three pair are to sell for $150, or $50 a pair. In the "Fire Department" there are two magnificently chased United States rifled muskets and their appurtenances, exhibited by J. M. Freeman, Esq.; and inside—in the "Wine and Liquor Department"— there is a basket containing twelve bottles of Madeira wine, between 60 and 70 years old! This basket and contents has been sold for $100. An old gentleman in Massachusetts, 91 years of age, made two small sad-irons for smoothing clothes, which were sold for $1.50 each. Howe's patent horse-shoe, faced with india rubber and warranted not to slip on the smoothest pavement, is also shown, but in a very disadvantageous and out-of-the-way place.

We have thus presented the briefest possible sketch of the "Machinery Department" of the fair, with a few other novelties that struck us in passing. To make a full report of the wonders of the "Curiosity Shop," the splendors of the "Picture Gallery," the glories of the "Arms and Trophies Room," or the luxuries of the "Restaurant," is out of the question. This is also true of the "Union Square Building," the "International Department" and the "Knickerbocker Kitchen," all of which are, even to us, sealed mysteries, for we have not found time to visit them. Such of the readers of the SCIENTIFIC AMERICAN who can make it convenient should not fail to visit our "Great Sanitary Fair."

CHEAP PAINTS.—The essential part of all good paints, properly so called, is linseed oil. Oil, if well boiled, may be applied alone, and affords an excellent protection to hard wood and implements, and upon floors. Sundry substances ground very fine are used to mix with the oil, and in proportion as they thicken the oil and form an opaque coating, they are said to possess "body." A pretty good cheap paint for outside work is made by mixing plaster of Paris with white lead, or zinc white, and grinding them together in a paint mill with oil. Plaster alone may be used, and it is said to form a durable and cheap paint. Of course any color may be given which is desired.—*American Agriculturist.*

AN unpleasant development was made in Cincinnati, the other day, concerning Catawba brandy. Responsible vinters declared that the pure article would cost from five to eight dollars a gallon, adding that there was no genuine article of the kind in the market—the quality generally sold consisting of pomace, whisky, and fusel oil.

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POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening, April 7th; the President, S. D. Tillman, Esq., in the chair.

THE ORIGINATOR OF SHELL GUNS.

Miscellaneous business being in order, the meeting was addressed as follows by—

Mr. Maynard—"Mr. Chairman, I see by the published reports of the proceedings that it was stated here by Mr. Heaton that the practice of horizontal shell-firing was inaugurated by the Russians. This is a mistake. During the administration of Jefferson, Col. Bomford devised a large gun—9-inch caliber—to throw shells horizontally; and he proposed to have it adopted in our service. The proposition was declined by the President, though a gun and shells were cast. Col. Paixhan, of the French service, saw the gun here, and through his influence it was adopted in France, receiving the name of the Paixhan gun. It was afterward adopted for our fortifications, and received the name originally proposed by Col. Bomford, the 'Columbiad.' Capt. Dahlgren made a series of experiments to determine the pressure in different parts of the gun, which showed that the metal should be differently distributed—a much larger proportion being required at the breech, and less about the muzzle. Guns were accordingly cast from Capt. Dahlgren's drawings, and these were called Dahlgren guns. These guns have been for many years the principal armament of our navy."

Mr. Dibbin:—"The chambers which Col. Bomford proposed in the breech of the guns have been abandoned, and all of the large guns are now cast without chambers in the breech."

No other miscellaneous business being offered, the President proceeded to read his weekly summary of scientific and industrial news, from which we select the following items :—

CHANGES IN CHEESE.

M. Blondeau has examined the changes produced in Roquefort cheese when stored away in cellars to acquire the flavor which recommends it to the taste of some people. He found fresh cheese contained—casein 85.43, fatty matter 1.85, lactic acid .88, water 11.84, total 100.

After being two months in a cellar, similar cheese contained—casein 42.28, margerin 18.30, olein 14.00, butyric acid .67, salt 4.45, water 19.30, total 100.

The remarkable change of casein into margerin and olein, the author believes, is due to a mycoderm of the genus *Penicillium*. The proportions of the last-named compound being nearly those found in butter, he concludes that butter is formed in the animal economy at the expense of casein.

WOLFRAM OR TUNGSTEN.

M. Le Guen states that his experiments prove that wolfram up to 2½ per cent. increases the hardness and tenacity of iron. Beyond this proportion it is prejudicial.

CALABAR.

Messrs. J. Jobst and O. Hesse, of Stuttgard, have published their researches made to ascertain the active principle of calabar, or the ordeal bean, used by the natives of Upper Guinea for testing the guilt of prisoners. They have succeeded in obtaining from the bean very minute quantities of an alkaloid which they call phytostigmin, in which the poisonous quality resides. It may be interesting to the medical jurist to know that two drops of this substance introduced into the eye of a rabbit, which was not killed by the poison, caused the pupils to contract one-fourth, while the eye of the rabbit poisoned by the alkaloid was not perceptibly affected. The eye of one poisoned by cyanide of potassium in scarcely contracted at all.

NEW SPECIES OF ANIMALS.

Among the 38 species of mammals, collected by Capt. Speke in Eastern Africa, is a new antelope, and of 60 varieties of birds 5 are new.

PHOTOGRAPHS AND MEMORY.

The distinguished Dr. Draper, of the New York University, in a late discourse thus speaks of the impressions made by light :—

"If after the eyelids have been closed for some time, as when we first awake in the morning, we suddenly and steadfastly gaze at a brightly illuminated object, and then quickly close the lids again, a phantom image is perceived in the infinite darkness before us. We may satisfy ourselves that this is not a fiction of the imagination, but a reality ; for many details that we had not time to examine in the momentary glance, may be contemplated at our leisure in the phantom. We may thus make out the pattern of such an object as a lace curtain hanging in the window, or the branches of a tree beyond. By degrees the image becomes less and less distinct; in a minute or two it has disappeared. It seems to have a tendency to float away in the vacancy before us. If you attempt to follow it by moving the eye-ball, it suddenly vanishes.

"Now the condition that regulates the vanishing phantom-images on the retina is, that when they have declined in vigor to less than $\frac{1}{64}$th of the intensity they had while in presence of the object that formed them, they cease to disturb the sight. This principle is illustrated when a candle-flame is held opposite to the sun, or any light having more than 64 times its own brilliancy. It then ceases to be visible. The most exact of all known methods for measuring light—that by the extinction of shadows—is an application of the same principle.

"But the great fact that concerns us is this :—Such a duration of impressions on the retina of the eye demonstrates that the effect of external influences on nerve vesicles is not necessarily transitory. It may continue for a long time. In this there is a correspondence to the duration, the emergence, the extinction of impressions on photographic preparations. Thus I have seen landscapes and architectural views taken in Mexico, 'developed'—as artists say—months subsequently; the images coming out, after the long voyage, in all their proper forms and in all their contrast of light and shade. The photograph had forgotten nothing. It had equally preserved the contour of the everlasting mountains and the passing smoke of a bandit fire.

"Are there then contained in the brain more permanently, as in the retina more transiently, the vestiges of impressions that have been gathered by the sensory organs? Do these constitute the basis of memory—the mind contemplating such pictures of past things and events as have been committed to her custody. In her silent galleries are there hung micrographs of the living and the dead, of scenes that we have visited, of incidents in which we have borne a part? Are these abiding impressions mere signal-marks, like the letters of a book, which impart ideas to the mind, or are they actual picture-images, inconceivably smaller than those made for us by artists, in which, by the aid of a microscope, we can see, in a space not bigger than a pin-hole, a whole family group at a glance?

"The phantom-images of the retina, as I have remarked, are not perceptible in the light of day. Those that exist in the sensorium, in like manner, do not attract our attention so long as the sensory organs are in vigorous operation, and occupied with bringing new impressions in. But when these organs become weary and dull, or when we experience hours of great anxiety, or are in twilight reveries, or asleep, the latent apparitions have their vividness increased by the contrast, and obtrude themselves on the mind. For the same reason they occupy us in the delirium of fevers, and doubtless also in the solemn moments of death. During a third part of our lives we are withdrawn from external influences—hearing, and sight, and the other senses are inactive; but the never sleeping mind—that pensive, that veiled enchantress, in her mysterious retirement, looks over the ambrotypes she has collected—ambrotypes, for they are unfading impressions—and combining them together as they chance to occur, weaves from them a web of dreams. Nature has thus introduced into our very organization a means of imparting to us suggestions on some of the most profound topics with which we can be concerned. It operates equally on the savage and on the civilized man, furnishing to both conceptions of a world in which all is unsubstantial. It marvelously extracts from the vestiges of the impressions of the past overwhelming proofs of the reality of the future, and gathering its power from what might seem a most unlikely source, it insensibly leads us—no matter who or where we may be—to a profound belief in the immortal and imperishable, from phantoms that have scarcely made their appearance before they are ready to vanish away!"

STEAM CARRIAGES.

The remainder of the evening was spent in listening to remarks from Mr. Nash on a variety of subjects, and to a paper from Mr. Fisher in which he advocated a new grading of the city of New York, the paving of the streets with plates of iron, the prohibition of the use of horses, and the substitution of steam carriages in their place. It was argued that with level streets there would be a large saving of the traction power required in removing merchandise from one part of the city to another, and that with iron pavements and without horses the streets would be cleaner and freer from dust, and the sidewalks would be more agreeable for pedestrians.

The "Utilization of Waste Products" was selected as the subject for the next meeting, and the Association adjourned.

Pleuro-Pneumonia.

Mr. Charles L. Flint, Secretary of the Massachusetts Board of Agriculture, has recently published a pamphlet of 15 pages on the above-named subject, after having visited the countries of Europe where the disease prevails. He makes the following startling statements:—

The most moderate estimates fix the loss by pleuro-pneumonia alone, in the British Isles, at ten millions of dollars a-year. The value of cattle, lost by this disease, amounts to two or three times the value of all the cattle imported. More than a million head of horned cattle died of pleuro-pneumonia in the six years ending 1860, of a value of at least sixty millions of dollars. Immense amounts of diseased meat are constantly offered and sold in the markets of England. More than nineteen tuns were detected in the London market in one week, in the summer of 1862. One inspector (of markets) said that if he were called upon to exclude from market animals affected with contagious diseases, he must exclude two thousand animals out of Islington market on many a Monday morning. The effects of this diseased meat are already discoverable in the impaired health of those who consume it. The disease is highly contagious. The most distinguished veterinary surgeons in the world now agree on this subject.

It still prevails to some extent in Massachusetts. On this point, Mr. Flint remarks:—"The disease still exists among the herds of some twelve or fifteen towns of this Commonwealth. The importance of an early consideration of the facts connected with its introduction and spread can hardly be overstated, whether we regard it in a pecuniary or in a sanitary point of view. If we are to give up all effort to eradicate it, we must settle down into the conviction that we shall soon find ourselves in the condition of those countries in Europe where this disease exists, and from which it is now probably too late to attempt to get rid of it, owing to the fabulous amount of the cost."

The First Striking Clock.

In the time of Alfred the Great, the Persians imported into Europe a machine which presented the first rudiments of a striking clock. It was brought as a present to Charlemagne from Abdallah, king of Persia, by two monks of Jerusalem, in the year 800. Among other presents, says Eginhart, was a horologe of brass, wonderfully constructed by some mechanical artifice, in which the course of the twelve hours *ad clepsydram vertebatur*, with as many little brass balls, which, at the close of each hour, dropped down on a sort of bell beneath, and sounded the end of the hour. There were also twelve figures of horsemen, who, when the twelve hours were completed, issued out of twelve windows, which till then stood open, and returning again, shut the windows after them. It is to be remembered that Eginhart was an eye-witness of what is here described ; and that he was an abbot, a skillful architect, and learned in the sciences.

IRON CEMENT.—To make an iron cement suitable for making rust joints, mix thoroughly 112 lbs. of clean cast-iron borings or turnings, with 8 ounces of sal-ammoniac, and 1 ounce of flour of sulphur, and add sufficient water. Keep wet when not to be immediately used, or it will heat and be spoiled.

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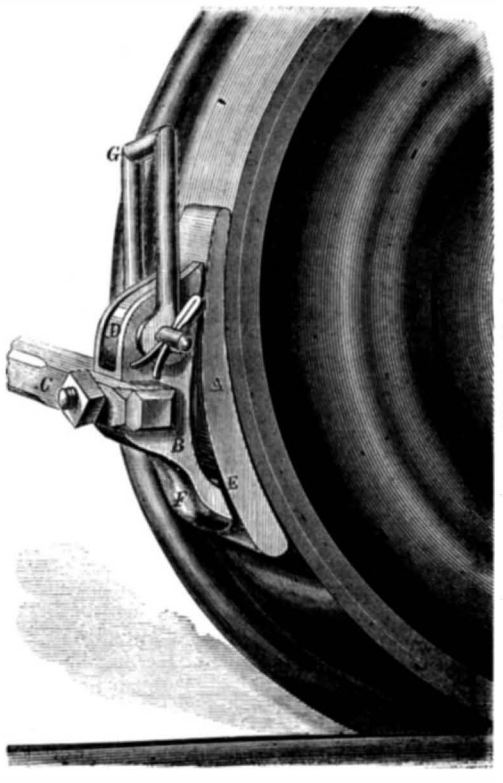
Effects of a Ninety-pound Charge.

The following account of the most powerful shot yet made is from the London *Times*. The gun is of wrought iron with a caliber of 13⅓ inches, just about the same as that of Ericsson's wrought-iron guns which are to be used in arming the *Dictator* and *Puritan:*—

"A curious and important experiment took place at Shoeburyness last week, to test the powers of the greatest gun yet forged by Sir William Armstrong against one of the thickest plates which Messrs. John Brown & Co.'s eminent firm have yet produced for actual armor-plating. The gun was the celebrated "Big Will," the 600-pounder, about which so many *canards* have been in circulation as to its having given way at the breech, &c., for all of which there has not been the slightest foundation. This magnificent piece of ordnance had only been fired twenty times, each time with the most prodigious result, and after the great experiment of Thursday it was as perfect inside and out as the day it left the factory at Elswick. The mass of iron, for it can hardly be called a plate, against which it was tried on Thursday was no less than 11 inches in thickness—a sample of one of many of the same enormous strength made by Messrs. Brown & Co., for the Russian Government, to plate the sea faces of some of the most important and exposed of the Cronstadt forts. According to the theory of the iron plate committee, that the strength of an iron plate increases as the square of of its thickness, the 11-inch mass, tried on Thursday, was equal in strength to no less than six plates of the famous *Warrior* target ; yet before the experiment commenced, not the slightest doubt was entertained that the 600-pounder would utterly smash it, if fired with a 600 lb. shot. The real interest of the experiment consisted in ascertaining—first, whether the same destructive result would be gained by using the gun as a smooth-bore, with a steel shot of half the weight; secondly, how the gun would stand the tremendous charge of 90 lbs. of powder; and thirdly, whether the fracture of the plate would show that even Messrs. Brown could manufacture one of 11 inches in thickness perfect throughout. These were the three points really at issue, and the solution of these was looked forward to with keen interest by all the officers on the ground. The first and only shot, we are happy to say, settled them all in the most satisfactory manner, and proved the enormous advantage of steel shot, the strength of the gun, and the excellent manufacture of the plate. The plate or slab of iron was 4 feet long by 3½ feet wide, and was unimpaired in its strength by a single bolt-hole or fastening. It was held up vertically against two 12 inch beams of solid oak, to which it was fastened by railway iron, passing up its face on either side. Behind it, and in support of the oak beams, was the Fairbairn target of 5 inch plates and a 1 inch inner skin, with the usual massive framework of iron rib beams. This target, however, did not support the plate to be fired at, but only the beams of oak which held it in position. There was an interval of 12 inches between the plate and the Fairbairn target, which was left purposely that the former might do its own work, if it could, unaided. The proceedings were commenced by firing two cast-iron round shot of 300 lbs. weight, levelled at 200 yards range, against a "dummy" target placed close alongside the 11-inch plate, for the purpose of determining the exact degree of elevation to be given to the gun. Both these were fired with the enormous charges of 90 lbs. of powder. Such charges, even with 600-pounders, would not be used in actual warfare, and for experimental purposes like that of Thursday were objectionable, as it seemed to make it almost as much an effort to destroy the gun as the target. To load "Big Will" with a sack of powder, such as two men could scarcely lift into its muzzle—such a sackful as it was never built to withstand, and such as it would not be loaded with in service—seemed, as an experiment, almost childish. The gun stood it perfectly to all outward seeming; but those conversant with the nature of wrought iron knew very well that the piece is so much the worse for the ordeal through which it has now been forced, and that they have, if anything, less confidence in "Big Will" after such a straining than they had before it was tested at all. Our system of testing wrought-iron guns is condemned, without an exception, by the artillery officers of all other nations in the world. The precise range having been ascertained, "Big Will" was again stuffed with a sackful of powder, but, instead of a cast-iron projectile, was loaded with a steel round shot of 344 lbs. weight, and levelled against the target. This shot struck the very center of the plate with a terrific crash, at a velocity of 1,560 feet, and at one blow closed the experiments for the day. Nothing further remained to be accomplished, for the target was gone. Never, probably, has a more tremendous blow been struck by human agency. The mass of steel driven by the tremendous charge of powder must have struck the target with a power almost inconceivable, for everything went down before it. The solid oak beams behind the plate were crushed into splinters, and the plate itself hurled bodily back against the Fairbairn target and split into two pieces—one huge piece being flung away to the right and the other to the left, and all this before the shot had time to penetrate to a greater depth than 4½ inches. The 11-inch plate, in fact, had not sufficient stability to receive the blow aimed at it; it was torn apart by the tremendous force with which it was jammed against the Fairbairn target behind, and an examination of the fracture showed that its manufacture was admirable. Fourteen feet in front of the target lay the steel shot, much flattened, and cracked, but evidently as good metal of its kind as Mr. Brown's plate itself. A close examination of the gun was next made by the Inspector of Artillery, and it was found to be wholly uninjured. Notwithstanding the use of steel round shot in a rifled gun, the grooves of the rifling remained as sharp and fine as ever, and only one feeling seemed to be entertained on the ground as to the strength of the gun and the excellence of the plate."

BING'S BRAKE SHOE.

This engraving represents a new shoe for car brakes; it is designed to act more efficiently than those ordinarily in use, to wear much longer and require less attention and repair. The construction of



it is simple and its operation is said to be satisfactory. The shoe, A, itself is of metal and is carried in a bracket, B, to which the brake beam, C, is attached. It will be seen that the lug, D, on the shoe is tapered where it enters the bracket, and that the shoe has a spur at E, which fits in a recess in the under part of the bracket at F. From this peculiarity the shoe always accommodates itself to the cone-like face of the car wheel, and acts as efficiently when rounding curves as when running on a straight line. This is not the case with the old brakes, which are rigid or fixed and at times present but a small portion of the bearing surface to the tread of the wheel. The clevis, G, is attached to the car as usual, and the bolt that runs through it is easily fitted so as not to cramp it. These shoes are made right and left to suit different sides of the cars, and are highly spoken of by those who have used them. The inventor says:—

"In the manufacture of my shoe there is a saving of at least fifty per cent; it can be secured in its place, or removed, in two or three minutes, and will wear much longer than the ordinary shoe, as it bears with its entire surface against the face of the wheel the moment the brake is applied. As the shoe is capable of a slight vibration, much of the strain is removed from the bolt which secures it to the brake beam, and the bolt does not therefore work loose as in ordinary shoes. This shoe has been tried on the West Chester and Philadelphia Railroad, and also no several of the passenger railroads in Philadelphia. The engineers on all the roads speak of it very highly and are about to place it on all their cars. In four months' trial on the Pennsylvania Central Railroad, my shoe outlasted two of the ordinary shoes. After the trial my shoe had worn away to five pounds, whereas, when the ordinary shoe had to be replaced by a new one, its weight was twelve pounds, the difference being that with my shoe but five pounds of waste iron were left after four months' trial, while in the other case, duriug the same time, twenty-four pounds of waste iron were left."

The patent for this invention was procured Oct. 6, 1863, by James Bing, of Philadelphia, Pa.; for further information address him at No. 2,222 Mt. Vernon street, Philadelphia.

How to prevent Wet Feet.

A writer in the *Mechanics' Magazine* says: "I have had three pairs of boots for the last six years, and I think I will not require any more for the next six years to come. The reason is that I treat them in the following manner: I put a pound each of tallow and resin in a pot on the fire; when melted and mixed, and apply it hot with a painter's brush until neither the sole nor upper will soak any more. If it is desired that the boots should immediately take a polish, dissolve an ounce of wax in a teaspoonful of turpentine and lampblack. A day or two after the boots have been treated with the resin and tallow, rub over them this wax and turpentine, but not before the fire. Thus the exterior will have a coat of wax alone and shine like a mirror. Tallow and grease become rancid, and rot the stitching or leather; but the resin gives it an antiseptic quality, which preserves the whole. Boots or shoes should be so large as to admit of wearing cork soles. Cork is so bad a conductor of heat that with it in the boots the feet are always warm on the coldest stone floor."

Sensible Maxims.

Never taste an atom when you are not hungry; it is suicidal.

Never hire servants who go in pairs, as sisters, cousins, or anything else.

Never speak of your father as "the old man."

Never reply to the epithet of a drunkard, a fool, or a fellow.

Never speak contemptuously of womankind.

Never abuse one who was once your bosom-friend, however bitter now.

Never smile at the expense of your religion or your Bible.

Never stand at the corner of a street.

Never insult poverty.

Never eat between meals.

SPECIAL NOTICES.

THEODORE ALTENEDER, of Philadelphia, Pa., has petitioned for the extension of a patent granted to him on July 16, 1850, for an improvement in joints for compasses for measuring.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, June 13, 1864.

FREDERICK M. BUTLER, of New York City, has petitioned for the extension of a patent granted to him on July 22, 1850, for an improvement in truss pads.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, July 11, 1864.

All persons interested are required to appear and show cause why said petitions should not be granted. Persons opposing the extensions are required to file their testimony in writing, at least twenty days before the final hearing.

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Correspondence

Effect of the Air on Weighing Grain.

Messrs. Editors:—There is generally much complaint about cargoes of grain falling short, which have been weighed into vessels at the Western shipping ports on the Northern lakes, when they come to discharge at the Eastern terminations of the different routes, as Buffalo, Oswego, Kingston, &c.

It is natural to suppose that grain in these transits should increase in weight to a slight extent, by absorption of moisture: there being scarcely any waste in handling. But lake vessels, or their managers, have become so used to "shortage" that they would readily pay $10, or $15, per trip as insurance against shortage, and consider it a good operation. It is really quite a tax upon the carrying trade of that region. The reasons assigned are close weight, management sometimes, &c. But there is one item which works against the carrier and tends to make up a deficiency, which is not taken into account. It is the difference of barometric altitude of the points of shipping and discharge. There is not much difference between Chicago and Buffalo—32 feet only, but between Lake Michigan ports and those of Lake Ontario, the difference of altitude in 325 feet. In figuring the difference of buoyancy of the atmosphere at these two levels, and its effect on a cargo of grain of 18,000 bushels, it is found that the difference is 9½ bushels, after allowing one-third to fill the interstices between the kernels, so that a cargo shall represent a solid of two-thirds its bulk.

The difference of altitude between Oswego and New York is 262 feet, and between Buffalo and New York it is 555 feet, so there must be still another defficiency in reaching tide water.

Nine and a half bushels of wheat at $2 or thereabouts per bushel, is quite too much to pay for the interference of the atmosphere, which refuses to have that much weighed and accredited. "A pound is a pound, &c.," hardly holds good in such a case, and when a transaction of weighing to and from becomes large, as in these cases, it is sufficient to be felt sensibly. F. A. Morley.

New York, April 4th, 1864.

To Curriers.---Wanted, a "Whitening" Machine.

Here is another field for the exhibition of inventors' skill. A correspondent of the *Shoe and Leather Reporter* writes as follows:—

Messrs. Editors:—I would like to call the attention of the public in general, and of inventors and "boss" curriers in particular, to the progress which machinery has made in the currying of leather. We have machines for every department in which machines can be used, except one. We have them for splitting, shaving, and flatting; also for setting out, stoning, glassing out of black and paste, and now one is wanted for *whitening*. I have not the least doubt but that such a machine could be obtained, but on the contrary am quite sure of success. Why cannot the heads that invented all the other machines invent one for this purpose? It is often the cass that as soon as an inventor gets up a machine, that somebody else makes an improvement and thereby obtains the benefits, while the original inventor derives scarcely any. I do not mean to discourage improvements, for this is a right which belongs to all, but why not arrange matters so that the inventor may have a liberal compensation for his efforts? I would propose that the "bosses" club together and agree to present a liberal premium to the person who invents the best whitening machine. By so doing, we would soon have machines for doing the principal part of the work, and there would still be work enough for all, and the "bosses" would never fear further trouble from strikes. S. J.

South Danvers, Mass., April 4, 1864.

Economy of Fuel.

Messrs. Editors:—I noticed in a late number of the Scientific American a few remarks of yours on the waste of fuel. I am satisfied, from my own experience, that this waste is the fault, generally, of proprietors—not of the engineer or fireman. If there is plenty of boiler, so that the fire will not need to be forced, the coal will be consumed thoroughly, for the simple reason that it is easier to do so than to punch it through the bars when half burned. I have lately put in two boilers, making double the capacity of the one formerly used, and find a saving in fuel, as well as a great saving of labor for the engineer. Again, as to the economy of using steam expansively. When we had only one boiler we could manage to run by careful firing with the cut-off at half stroke, but could not make steam enough to run at the same speed, using the steam at full stroke. We have lately increased our piston speed fifty per cent., and reduced the amount of steam in same proportion, and are, so far, satisfied with the result. As to oiling the cylinder, we find that when the engine lags, from low steam, an application of oil through the steam chest is equal to several pounds pressure by the gage; but as to which is the cheapest—oil or fuel—we have never "ciphered out." J. L. H.

Cincinnati, Ohio, April 4th, 1864.

[Our correspondent's views are correct and to the point. It is a very common error to make boilers too small for their duty; we always advise 15 feet of heating surface to the horse-power, and in many cases even 20 is better than the quantity usually given, which is ten. It is cheaper in every respect to have ten horse-power surplus in the boiler than just enough to keep the engine running. Coal will not burn when it is continually raked up, "poked," "sliced," &c., and it is only by slowly roasting away upon the grates that the greatest economic effect is obtained. Lubricating the cylinder has the effect spoken of by our correspondent, but the question of economy is not between fuel and oil, but between repairs and fuel, caused by the injurious action of the oil or fat. Engines working moist steam generally require little lubrication of the valves and cylinders; but with vapor of a high temperature the case is different.—Eds.

Well Satisfied.

Messrs. Munn & Co.:—I have the great pleasure of acknowledging the receipt of my Letters Patent for an improved Cork-cutting Machine; also your prompt reply to my inquiry for information in regard to foreign patents. I now wish to say a few words to inventors if you will please publish it. If they wish to get their patents "put through" in the least possible time and expense, and the best specifications and claims, and have all their inquiries answered with promptness, dispatch, and reliability, let them employ Messrs. Munn & Co.; and all will be done as I have stated. The pleasure I have received in employing them has caused me to make these remarks.

Isaac Goodspeed.

Norwich, Conn., April 10, 1864.

Talk in a Sanctum.

Editor, to a critical friend.—You read all sorts of papers. Now tell me honestly which of all the papers in the United States do you like best?

Critic.—I will tell you. But you will be surprised. Of all the papers that I read, I like the Scientific American best. It is the most conscientious. It has the most *real* news, *i. e.*, news from the headquarters of the army of progress. I think it a little illiberal toward Spiritualism and such things, and a little apt to be cynical in its criticisms of "erring brethren;" but it clings to the truth closer than any paper that I meet with, and its affinities are with the best class of men in this or any other country, viz: the intelligent progressive workers.

[We copy the above straightforward notice of the Scientific American from *The Circular*, published weekly at Wallingford, Conn., by the Oneida and Wallingford communities. We thank the editor for his friendly criticism.—Eds.

The New Zealand Exhibition.—An exhibition of the industry of all nations will be opened in the city of Dunedin, Province of New Zealand, on the first of January, 1865. The schedule embraces every variety of production in art, science, and agriculture. An invitation is cordially extended to the citizens of the United States to send in contributions. The New Zealand agent is P. L. Simmonds, Editor of the *Technologist*, No. 3 Adelaide Place, London Bridge, London, to whom all communications should be addressed.

Recent Southern Intelligence.

From a file of Southern papers recently received at this office we glean the following items:—

"Gold sold at auction in Richmond on the 7th at from 23 to 24 for one. It will be lower before it is higher."

The Richmond *Examiner* gets off the following anecdote, which, as the editor states, portrays facetiously the condition of the "rebs":—

"A correspondent sends us a note of an incident in the army of Virginia, which, while it contains a painful evidence of the sufferings of our soldiers, illustrates also the good humor with which they endure the pain and privation that fall to their lot. It appears that the order announcing the hour of inspection required all to be in line, save those excused by surgeons. It, of course, brought out those who were barefooted.

"It being a cold, frosty morning, one of the soldiers, being entirely destitute of shoes, took off his hat and placed it under his feet. The inspector approaching him, accosted him thus: 'Where's your hat?'

"Soldier—'Under my feet.'

"Inspector—'Why do you wear your hat on the wrong end?'

"Soldier—'I always wear it on the end it does the most good.'"

The following, from the Wilmington (N. C.) *Daily Journal*, contains some facts which show how destitute of the necessities of life the Southerners are:—

"Now is the time to fall back on 'hog and hominy'—if you have them. Next to nothing comes to market, and that must be bought and sold by the ten dollars' worth, or by some multiple of ten dollars. The restaurants and oyster shops are generally closed, partly for want of stock, and partly for want of change. Change is the worst difficulty. It stops things coming in, or being bought or sold. It would be prudent if practicable, for people to fund themselves until after the first of April. As nothing can be done, and no eatables can be obtained, it would be desirable to find holes or caves in the ground to which people could retire for a brief hybernation of four or five weeks, during which time they might derive sustenance and amusement from sucking their paws after the manner of the black bear. Seriously, things have got to a pass positively alarming, and which threatens consequences of the gravest character. We confess ourselves unable to see what people are to do, if things keep on this way, getting worse and worse, as they will do the nearer the first of April approaches."

The following advertisement appears in the Wilmington (N. C.) *Daily Journal*, and is of importance to the farmers in the vicinity of Wilmington, if not of interest to our prosperous farmers at the North. The contrast between the producers of the South and North must be rather apparent to any one reading the annexed advertisement:—

"TO THE FARMERS IN 12 MILES OF WILMINGTON.

YOU ARE HEREBY NOTIFIED that you must pay your tax in Kind. Quartermaster's stores, to Capt. C. W. Styron, as follows: Corn, Fodder, Hay, Ground Peas and Oats. Commissary stores, to Capt. C. S. McKinney, as follows: Bacon, Peas, Wheat, Rye, Rice, &c. The Tax in Kind must be paid by the first day of June, 1864, or five times the value of the estimate will be collected.

J. M. McGOWAN, Capt. and Post Q. M.
4th Congressional District, N. C."

The Lost Found.—A recent number of the Richmond *Sentinel* contains the following advertisement:—

STOLEN, by the Yankees in command of Dahlgren, a small dark bay MARE, blooded, very spirited, nearly fifteen hands high, small limbs and feet, and small white spot in forehead. On inside of right fore foot was a lump arising from a snag, but recently healed. On the outside of the left hind leg, just below the hock, was an old scar, nearly two inches long, with little hair upon it. On her left side, just at the coupling, was a small white spot. There were several white saddle-marks on her back, a large one on each side of the wethers. Her age is between five and seven. She is supposed to have been left on the road between Dover Mills, Goochland county, and Richmond, or recaptured in King and Queen county. Should this meet the eye of any one knowing where the above animal can be found, he would greatly oblige me by letting me know as soon as possible. Address Lt. W. A. DEAS,
Char's Art'y Batt'n, Army Northern Va.

We suspect Lieut. Deas will find his blooded mare at the great Metropolitan Fair Exhibition, now open in this city. An animal answering this description has been contributed by an officer in the expedition referred to, which is not only on exhibition but is offered for sale for the benefit of the Sanitary Commission. Unless the rebel lieutenant calls early and proves property it is doubtful if he ever sees his pet mare again. There is no time to be lost, lieutenant, and the best thing you can do is to leap on the first mare you can get, speed your way to the Federal lines, take the oath of allegiance, attend our fair and claim your prize mare.

The full capacity of the saw-mills at Minneapolis (Falls of St. Anthony) Minnesota, is 250,000 feet every twenty-four hours. It is expected to cut during the coming season, 42,000,000 feet of lumber, 20,000,000 feet of lath, and 16,000,000 shingles.

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Mental Rest.

When a locomotive is under full headway it cannot be safely stopped in a moment. So when the nervous energy of the human system has been acting on the brain under a "full head" for an hour or more, as in the performance of the most harrowing tragedy, or in the delivery of an impassioned address, or in the execution of some momentous surgical operation, it is not safe to arrest instantly the outgoing of that power through the brain; the fact is, it is not possible if the performers just named were carried direct from the theater of their operations to a prison or vacant room, and were so bound that bodily motion was impossible, the mind would run in ceaseless circles over the performances, would be vainly striking against the air, and sleep would be impossible, except as a result of sheer exhaustion; even then it would not bring its natural renovation; the tragedian, in spite of himself, would go over his part; the orator would rehearse his sentences; the advocate would joint together again his points and proofs; the minister repeat his weighty appeals; and the surgeon perform again his terrible operations, all in the mind, vainly, and with the almost invariable accompaniment, disagreeable and wearing—to wit, measuring the effects which might have resulted from certain variations in their respective performances, the surgeon would think that his operation might have been sooner performed, or would have had a more favorable recovery if he had done this, that, or the other thing which he had not done; the clergyman will have his conscience touched by the reflection that if he had applied another text of Scripture, or presented another line of argument, or had summoned a deeper feeling of the heart, his discourse would have made a more lasting impression, and might have eventuated in more ineffaceable convictions. In one sense, these are vain thoughts; they increase the exhaustion attendant on the previous actual labors, and are altogether unprofitable. The greatest lady *tragedienne* of modern times, Rachel, after an exciting performance, would go home, and although past midnight, would sometimes spend an hour or more in the physical effort of moving the furniture of one room into another, and in arranging it, as if it were to remain so for months, as a means of calming the mental excitement, so that she could go to sleep; the philosophy of the matter was that the nervous energy was diverted from the brain, and compelled, in a measure, to pass out of the system through muscular action, while the mental exercise necessary was such as to engage a different portion of the brain altogether, allowing those organs opportunity of quiescence, which had been so lately exercised to an unwonted degree. Our clerical readers know it often happens that Sunday night is the worst night for sleep in the week, especially for those lazy and improvident and unsystematic "unfortunates" who put off their preparation for the Sabbath until the very last moment, as it were, and hence have to sit up late on Saturday night, and even encroach on the sacred hours of the Sabbath, thus profaning holy time, in the feeling that the end sanctifies the means, or that it is a perfectly legitimate labor, forgetting that it is an unnecessary labor, as it might and ought to have been done in proper work-days. As we were saying, clergymen sometimes cannot get to sleep for hours after preaching at night; let such take a lesson from the above recital, and instead of going to bed as soon as they get home, let them perform some muscular movements, with the end above-named in view; or, if that be not practicable at times, they should divert the current of nervous energy from the organs of the brain which have been unusually exercised, to the consideration of subjects which will employ other organs. This may very well be done by reading a number of short articles on every variety of subject and by various authors, such as we have strung together in the preceding pages. This is very much on the same principle that one set of muscles are rested by the exercise of another set, which allows them to be quiescent.

There are times to all, when the most industrious are utterly indisposed to do a single hand's turn, when the most diligent readers and thinkers lose the power of concentration, and would entirely fail to interest the mind in reading the most exciting history; neither can they go to sleep, which indeed would be the very best thing they could do; and then again, in times of great calamity, or trouble, or despondency, which unfortunately come to all, sooner or later, it will answer an excellent purpose to divert the mind and rest it by reading a variety of short articles, which require no lengthened thought, no special mental effort to take in; even in these cases the reading may sometimes be almost mechanical, yet every now and then a paragraph will be met with, which will compel attention more or less; sometimes from its incongruity, its oddity, its fun, its ridiculousness, or its profundity. Some of our weekly exchanges are valuable in this regard, by having half a column or more of miscellanies, brevities, jottings-down, &c.; those afford the means of mental diversion, recreation, and rest, which are of great value in connection with the subject in hand. When a man "don't feel like doing a single thing," he is in danger, because he is very apt, under such circumstances, to dawdle or mope about and do nothing, the very state of mind which the great adversary delights to find, and is sure to take advantage of,

> "For Satan finds some mischief still
> For idle hands to do,"

as the unequaled Isaac Watts has written. Rather than allow perfect idleness under any circumstances read the newspaper with its short and varied articles, even its advertisements, or even an antiquated scrap-book, as a healthful mental diversion, recreation, and rest under the circumstances adverted to. To the Christian heart, to that happiest of human kind who can receive with an unquestioning confidence and childlike trust all that the Bible says, the Psalms of David and the Proverbs of Solomon are of incalculable value in this connection; they make the body forget its weariness, they bring comfort to the despondING, cheer to the broken-hearted, courage to the fallen, and faith and rest and hope and happiness to all.—*Hall's Journal of Health.*

The Influence of Fluxes on the Composition of Manganiferous Cast-Irons.

The following account was recently communicated to the French Academy by M. H. Caron:—

"In a recent note I showed by experiments, supported by analyses, that manganese served, in cast-irons, to expel sulphur, and often silicium; I added, that sulphurous and silicious cast-iron might be improved by cast-iron charged with manganese, which would be the more valuable according to their richness in manganese. Consequently it would be well to possess means of extracting from the ore the cast-iron most charged with this purifying metal. There are two causes, all other things being equal, which singularly influence the amount of manganese contained in cast iron:—1st. The flux employed in the reduction of the ore. 2nd. The temperature at which this reduction is effected. I have ascertained the effects of these two causes by experiments, of which I will here give some description. The ore on which I operated was a carbonate of iron and magnanese, having the following composition :—

Carbonate of iron	71·0
Carbonate of manganese	13·3
Carbonate of magnesia	11·2
Carbonate of lime	0·2
Silica (quartz)	4·3
	100·0

"Several kilogrammes of this ore were finely pulverized and perfectly mixed together. In each of the assays, of which I shall give you the results, I used the same quantity of this ore; the wood charcoal mixed with the ore was in each instance used in the same way; finally, all the crucibles were brasqued with a mixture of graphite and molasses, or coal tar. The following table shows the kind, and the quantity of flux used per cent. of ore, and the colors of the cast-iron obtained, as well as their richness in silicium and manganese. In the experiments from Nos. 1 to 5, inclusive, the temperature employed for the reduction was always decidedly the same;—the temperature for No. 6 was as low as possible (high enough, however to allow the cast-iron to coliect). In assay No. 7, on the contrary, the heat must have been great enough to melt several hundred grammes of soft steel :—

No.	Colour of the cast iron.	Manganese per cent	Silicium per cent.
1. Carbonate of lime……10	White	7·93	0·05
2. Carbonate of lime…… 5	White	6·32	0·08
3. Fluoride of calcium…… 5		4·70	0·30
4. Silicious earth…… 5	Grey	3·81	0·55
5. Silicious earth……10	Very grey	2·25	0·76
6. Silicious earth…… 5	Grey	3·90	0·50 L. t.
7. Silicious earth…… 5	Grey	2·10	0·75 H. t.

"Assays Nos. 1, 2, 3, 4, and 5 show that, to obtain cast iron rich in manganese from a given ore, as much lime must be used as can be introduced without spoiling the fusibility of the slag. It will be found, on the contrary, that the proportion of manganese diminishes as the silicious flux increases, and what is remarkable that, as the manganese disappears, silicium takes its place in the cast iron, The temperature used for the reduction also exercises a notable influence on the richness of the cast iron in manganese. Assays 6 and 7 show that the higher the temperature the less manganese, but the more silicium will be found in the cast iron. As in the preceding experiments, silicium and manganese seem mutually to expel one another. It will not be uninteresting to observe the nature of the cast irons obtained. A sufficient quantity of lime produces white cast irons, while silicia produces grey. By simply changing the flux, we may then obtain, at will, either white or grey steel or iron, or cast iron. I will not further enlarge upon these results; they are such as can be perfectly appreciated by metallurgists. I speak now of cast irons obtained with iron ores containing oxide of manganese or mixtures with it. Lime has not exactly the same influence on non-manganiferous ores; but the question should be treated in a special manner, and I trust soon to be able so to treat it. The assays, the results of which I have laid before the Academy, are only laboratory experiments, but still I hope they may prove of some service. Thus, ironmasters who mix ores rich in manganese with their ordinary ores (sulphureted or silicitated), for the purpose of ameliorating their products, may without fear gradually increase the usual quantity of flux without seriously diminishing the liquidity of their slag. If the flux thus modified becomes too refractory the addition of sea salt or chloride of calcium soon gives them the desired amount of fusibility. In this case, fluor-spar or cryolite will produce the same effects; but as these bodies, especially the latter, always contain notable quantities of phosphoric acid, which is very destructive to cast iron, the greatest care must be taken in using them."

A Whistling Beetle.

Gosse, in his "Romance of Natural History," says :—"During our ride home (in Tobago), I was startled by hearing what I fully imagined was the whistle of a steam-engine; but I was informed it was a noise caused by a beetle that is peculiar to Tobago. It is nearly the size of a man's hand, and fixing itself against a tree, it commences a kind of humming noise, which gradually quickens to a whistle, and at length increases in shrillness and intensity, till it almost equals a railroad-whistle. It was so loud that, when standing full twenty yards from the tree where it was in operation, the sound was so shrill, that you had to raise your voice considerably to address your neighbor. The entomological productions of the tropics struck me as being quite as astonishing in size and nature as the botanical or zoological wonders. There is another beetle, called the razor-grinder, that imitates the sound of a knife-grinding machine so exactly, that it is impossible to divest one's self of the belief that one is in reality listening to some 'needy knife-grinder,' who has wandered out to the tropical wilds on spec."

FAULT-FINDING WITH YOUR CHILDREN.—It is at times necessary to censure and punish; but very much more may be done by encouraging children when they do well. Be, therefore, more careful to express your approbation of good conduct than your disapprobation of bad. Nothing can more discourage a child than a spirit of incessant fault-finding on the part of its parents; and hardly anything can exert a more injurious influence upon the disposition both of the parent and child. There are two great motives influencing human action—hope and fear. Both of these are at times necessary. But who would not prefer to have her child influenced to good conduct by a desire of pleasing rather than by the fear of offending? If a mother never expresses her gratification when her children do well, and is always censuring them when she sees anything amiss, they are discouraged and unhappy; their dispositions become hardened and soured by this ceaseless fretting; and, at last, finding that, whether they do well or ill, they are equally found fault with, they relinquish all efforts to please, and become heedless of reproaches.—*N. Y. Dispatch.*

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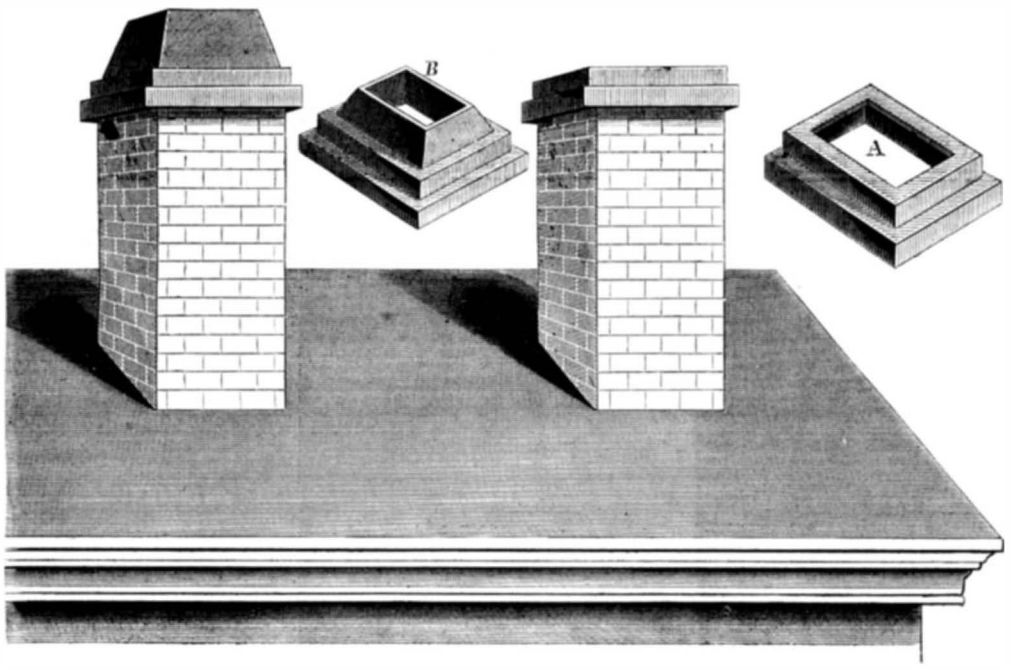
Improved Chimney Pot and Cap.

The engravings published herewith represent a new attachment for chimneys which is designed to prevent the evil of smoking, and to protect the chimney itself from the action of the weather. The material of which this cap is composed is potter's clay baked and glazed, and it is set in mortar or cement on the chimney top itself. When in position the cap, A, rests upon the brick-work of the chimney, and the other part, B, which tapers upward, is set on the cap, A. The inventors claim that by this arrangement the chimney is prevented from smoking and that the structure will last much longer than without this protection. Also, that it increases the dratt and is a desirable and ornamental addition to the building, giving a neat and finished appearance. The pot and cap may be applied either separately or together; or both attachments can be made in one piece if desired, and any required dimensions can be made to order.



SWEET'S CHIMNEY POT AND CAP.

The entire patent or State, county or town rights are for sale. For further information address the inventors, Alonzo L. Sweet, at Norwich, Conn., by whom it was patented through the Scientific American Patent Agency Feb. 16, 1864. For further information address the inventor as above.

Experiment on a Wool Target.

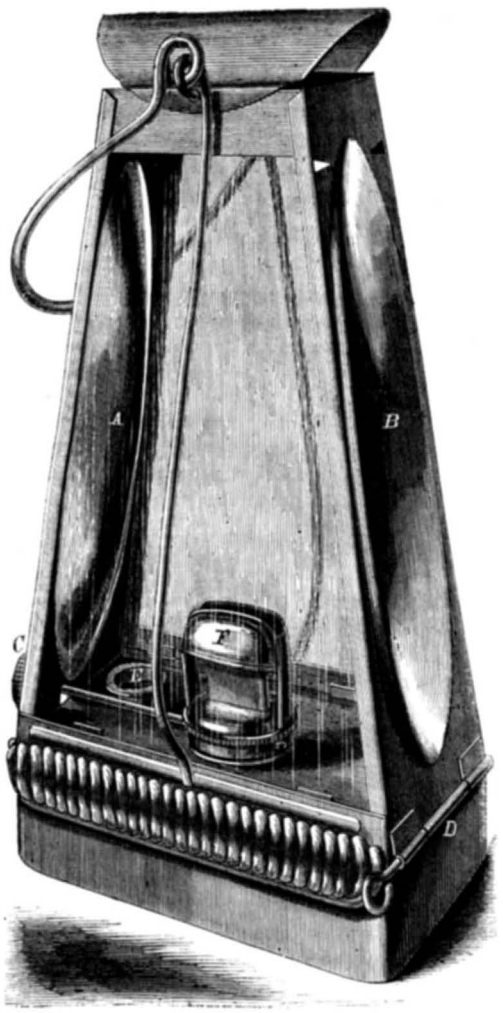
The London *Times*, in an account of experiments at Shoeburyness, has the following:—

"Another theoretical novelty in the way of targets was tested at this practice-ground on Wednesday week, and, like most of the extraordinary novelties that are brought there, was proved to be utterly worthless in two shots. The target was one composed of compressed wool, made after Mr. Nasmyth's plan; that gentleman and a very large number of others also, entertaining a confident opinion that a good thickness of wool, when pressed tight, would offer an amount of resistance to shot which, if not sufficient to keep it out altogether, was, at least, certain to be enough to justify the Government in making experimental inquiries on the subject. We do not know, even if the discovery had been successful, how it was proposed to utilize it—how, for instance, to recoat our ironsides with 10 or 12 feet of pressed wool, or how to apply so bulky and cumbrous an appliance in any way. Fortunately there is no necessity for considering such embarrassing speculations now, inasmuch as the experiment of Wednesday proved the wool rather more permeable to shot than almost any other novelty that has yet been fired at. A very few words is sufficient to tell the result. The target, if we may so call it, was a wrought iron tube, like a boiler or iron funnel, open at both ends, 10 feet in diameter and about 11 feet long. The wool part of the target was constructed by tilting this on end and filling it with wool as tightly as men could trample it down till the cylinder was full. It was then laid on its side fronting the gun, so as to present the appearance or a large white circular target or drum, 10 feet in diameter, and 11 feet thick of solid wood.

"The first shot was fired from the Armstrong 100-pounder, with a 10-lb. charge, and this not only passed through the target from end to end, but buried itself in the earth behind. A second shot was fired from the 68-pounder, with the usual service charge, and this also went through, burying itself in the bank, and as a means of resistance the target was such a palpable and utter failure that even Mr. Nasmyth was satisfied with these two shots, and concurred in the uselessness of firing any more. The result exactly fulfilled the anticipations of the iron-plate and ordnance committees, who, however, concurred in the propriety of trying the experiment, for the sake of exploding and putting an end to the theory forever. One would think, however, that the extensive and expensive experience the Government have had of the value of these new theories would by this time have given them sufficient confidence to say 'No' to experiments with any further crotchets, except at the inventor's own expense."

PATENT REFLECTOR LANTERN.

This ingeniously-arranged lantern is intended for burning coal-oils without a chimney; the formation



of the lantern itself being such that it constitutes a chimney and creates a draught for the maintenance of the light without employing the glass tubes generally used for that purpose, thus obviating the trouble and expense which they cause. The construction of this lantern is such that it will, no doubt, be extremely popular; it can be swung around or carried in strong draughts without extinguishing the flame; it is entirely without solder in the upper part, making it much more durable, and it has the glass sides so arranged that they are much less liable to break than others; when they are broken an ordinary glazier can replace them. This lantern is also fitted with convex reflectors, A and B, which serve to increase the light and also afford a protection to the eyes of the person carrying it. The flame is regulated from the outside by the button, C, and the top is hinged at D, to the lantern so that the oil may be poured in at E; there is also a device over the wick at E, which causes the flame to burn brightly and steadily without a chimney, even if the outer case be removed. This burner is well adapted for hand lamps, and will be furnished to dealers separately if desired. The lantern is convenient in form and size for general use. Patented April 28, 1863, through the Scientific American Patent Agency. Further information can be had by addressing Archer & Pancoast, 9, 11, and 13 Mercer street, New York.

The Iron-clad "Ironsides."

We have been furnished, by an eminent naval officer, with the following table, exhibiting the performances and the capacity for resistance of the *Ironsides* frigate in Charleston harbor—proving her by the severest and most continued hostile tests, to be the most perfectly armored vessel in the world. It will be perceived that she was struck by the shots of the enemy 241 times, one hundred and forty of which thundered against her in the short period of two days; but notwithstanding, she has passed through the terrible ordeal without having sustained any serious damage, and with the loss of only one man killed. This is a most satisfactory evidence of her great powers of endurance. The table, we may promise, is entirely authentic, and the information contained in it has, we believe, never before been made public. It is as follows:—

DATE.	SHOTS FIRED.	TIMES STRUCK.
April 7, 1863	8 rounds.	Several.
July 18	805 rounds.	10 times.
July 20	168 rounds.	13 times.
July 24	220 rounds.	12 times.
July 29	210 rounds.	2 times.
July 30	366 rounds.	3 times.
Aug. 17	428 rounds.	30 times.
Aug. 18	158 rounds.	Not struck.
Aug. 19	64 rounds.	Not struck.
Aug. 20	168 rounds.	Not struck.
Aug. 21	114 rounds.	1 time.
Aug. 22	182 rounds.	Not struck.
Aug. 23	88 rounds.	5 times.
Sept. 2	50 rounds.	7 times.
Sept. 5	504 rounds.	15 times.
Sept. 6	238 rounds.	3 times.
Sept. 7	152 rounds.	50 times.
Sept. 8	488 rounds.	90 times.
Total	4,561 rounds.	241 times struck.

[*Newark Advertiser.*

[The items wanting to make the account complete are omitted. What was the range, the size, and velocity of the shot?—EDS.

WATER FOR JERUSALEM.—It is proposed by a company to construct sewers, and supply water conduits in the city of Jerusalem. There are still evidences remaining that water was once had there in great abundance. The great reservoir beneath the Temple, 736 feet in circuit and 42 in depth, held two millions of gallons, and there were upwards of thirty smaller reservoirs connected with it. The Pool of Bethesda, now dry, contained 21,874,742 gallons; and the Pools of Solomon, about seven miles distant from the city, held 50,136,320.

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VOL. X. NO. 17..[NEW SERIES.].....*Twentieth Year.*

NEW YORK, SATURDAY, APRIL 23, 1864.

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INTERESTING FACTS CONCERNING THE GOODYEAR PATENT CASE.

A correspondent writes to us as follows:—"I am credibly informed that the rubber monopoly company have agents out in all directions, apparently very earnest in securing signatures to remonstrances against the renewal of the Goodyear patents, which petitions they propose to retain quietly in their possession, thereby preventing the popular indignation reaching the ears of the authorities who are to decide the case." We are somewhat suspicious that this system of tactics is now being carried on, though we have no personal knowledge on this point. It has recently been said in our hearing that there are a few well-known parties who act as though they were opposed to the extension of the patents; and yet, in reality, they are working for the interests of the "combination." It appears from some of the testimony now in the hands of the Committee on Patents, that this collusion game was practiced at the time when the application for the first extension of the patent was pending before Commissioner Holt. One of the witnesses—Hon. Thomas A. Jenckes, now Chairman of the Committee on Patents—testified that the opposition from a certain quarter was "not in reality but only in form." Another of the counsel for the extension testified that he was apprehensive that if Commissioner Holt supposed that certain parties were in any way colluding to obtain the extension, its defeat would be certain. These sham remonstrants go around like "one of old," and call on the people to see their zeal; and in so doing they divert public attention from that active opposition which otherwise would be earnestly and honestly made against the present application before Congress. The scheme is an adroit one; and its author ought to file his caveat for it; but what will the public think of the impudence—to say nothing of the moral turpitude—involved in such transactions?

There are other facts, connected with the case before Congress, which are of interest to the people. The Committee on Patents in the House of Representatives is composed of the following-named gentleman, to wit, Hon. Thomas A. Jenckes, of R. I. (chairman), Leonard Meyers, of Pa., Warren P. Noble, of Ohio., John H. Hubbard, of Conn., and John W. Chanler, of New York city. Mr. Jenckes was at one time counsel for H. H. Day, and fought the Goodyear patents with all his might. Mr. Day appeared in opposition to the first extension of the patent before Commissioner Holt; and yet with his (Day's) consent, his leading counsel, Mr. Jenckes, favored that extension. We understand that Mr. Jenckes now favors the second extension of the patent by Congress; and he therefore does not act on the committee to hear the case. Mr. Meyers, another member of the committee, is also a retained counsel in the india-rubber interests; and he therefore also declines to act with the committee. In stating these facts we do not intend to cast suspicion upon the honorable intention of either of the gentlemen named—they are, no doubt, men of high integrity; but we regret that the composition of the Patent Committee is such that two of its members cannot act with their colleagues in hearing a case of such magnitude and importance.

Of the three remaining gentlemen of the committee, we understand that Mr. Hubbard is acting as Chairman. Mr. Hubbard is an upright man; but he has no power in this case to send for "persons and papers," which he ought to have. We call upon Mr. Hubbard to apply to the House for power to send for "persons and papers," if he wishes to dig down to the foundations; for unless he does this he will only get a partial and one-sided view of the facts.

We are pleased to notice that the opposition to the further extension of the Goodyear patent is increasing. On Monday last Senator Cowan presented the remonstrance of the Legislature of Pennsylvania, and we notice that the various railroads in the country are sending in remonstrances to the same effect. This is the true way to defeat the application; Congress cannot in the face of a strenuous opposition vote another extension.

INSPECT YOUR STEAM BOILERS.

Boiler explosions are becoming remarkably prevalent. Scarcely a day passes but what, from some part of the country, remote or near, we receive intelligence of a great disaster. It is perhaps, inevitable that some boilers should explode, out of the vast number in daily use on land and sea, in the factory and on the rail; it would be strange indeed, if that curse of humanity—carelessness, was not felt in its magnitude; for, reason and theorize as we may, it is a well-settled fact in the minds of scientific and practical men, here and abroad, that to this cause most of the accidents with steam may be traced. It is carelessness that makes boilers on bad plans of poor workmanship and material; it is carelessness which omits the thorough inspection which boilers should have every thirty days; it is carelessness which permits crownsheets and flues to be burnt from scarcity of water, and water-bottoms, legs, and fire boxes to be bent, burnt and distorted from deposits of mud, scale, or refuse that is suffered to accumulate; it is carelessness which allows safety valves to be jammed or overloaded, feed pumps to look after themselves, braces to be slack where they should be taut, and the pins in the braces not turned, or bent over, so that they cannot slip out; such cases have been known. It is more than carelessness which allows imperfectly welded wrought-iron sleeves for the socket bolts to be used to cover the same, for the water has free access through the open seams and destroys the bolt as quickly as if there was no "protection." Cast-iron sleeves are now used in the best shops, and besides being a perfect protection to the socket-bolts, they are more durable and much cheaper. From the first hours of its practical operation until the day of its final condemnation, a boiler is constantly growing weaker, and it should be so cared for that the work it is obliged to do is proportionate to its strength each year. To ascertain what the strength is, we must test it, and this can be done in a simple, cheap, and expeditious manner by water and heat. If a boiler be filled *full* of water up to the very safety valves and all apertures closed, when a fire is built in the furnace, the water will be expanded, and raise the valve, if the boiler is strong enough to withstand the strain, but if it is not, the weakest part will be shown and sometimes sheets are torn out by this method. Steam is not generated from the water during this test, and if a rupture does take place in the boiler no one will be injured by it. The safety valve must be loaded to the utmost limit of strain that it is supposed the boiler will bear; and if the test is favorable, only three-fourths of the load on the safety valve must be employed for the working pressure.

It has never been proved beyond question that a steam boiler exploded from any of the theories put forth in each disaster. Some persons have a passion for "explaining" matters that they do not understand by something else they are ignorant of; and we have had hydrogen gas brought forward as an agent in causing explosions; water suddenly flashed into steam as another; electricity for another; and so on, through the category. These are simply excuses on the part of some one at fault for the disaster. *After* a boiler has exploded, it seems almost superogatory to go and look at it, and say what caused the disaster. We have heaps of smoking ruins, iron bent and blackened and in most cases each part is a fac-simile of every other explosion; the torn sheets are gravely examined and the conclusion arrived at is that "somebody was to blame."

We have no desire to treat the matter with levity, but is it not time that we had more careful superintendence of steam boilers and fewer inquests? In some cases, the cause of the accident may be pointed out after the explosion but in such it might have been done equally well before. As we have before remarked it is to be expected that some boilers will explode in spite of all inspection, just as cannon do with the most careful gunners, but it is a part, and a most important part of an engineer's duty to be thoroughly convinced of the soundness and strength of his boiler. When we see how seldom accidents of this kind occur to marine boilers we have positive proof of the value of thorough oversight and watchfulness; and we feel that we cannot speak too strongly or too often in the SCIENTIFIC AMERICAN, upon the necessity which exists for prompt, thorough, and frequent inspection of steam boilers.

AIR SURFACE CONDENSERS.

An experiment in surface condensation by means of a current of air, has just been made at Hecker's flour mills in this city, which will be of wide interest to the users of steam engines. The deposits of sediment from the Croton water have proved to be so great an inconvenience that Mr. Hecker determined to make an effort to overcome the difficulty, and naturally turned his attention to the plan of procuring pure distilled water by means of surface condensation. The East River is near his mill, and the expense would not be great of obtaining an ample supply of salt water as the medium for condensing the fresh water to be used in the boilers, but after a thorough consideration of this method, Mr. Hecker decided to make the experiment of condensing with a current of air.

Some frames each 2½ by 7 feet were made of strips of wood 2 inches square, and covered on both sides with plates of sheet iron, weighing 17 ounces to the square foot—No. 24 of the English gage. These frames or boxes are placed on end by the side of each other with a narrow space between for the passage of air. The exhaust steam is admitted to the interior of the boxes, and a current of air is drawn between them by means of a fan. By drawing the air, it is expanded and its temperature is lowered, while if it were pushed through the spaces, it would be compressed and its temperature would be raised. By drawing the air there is also a saving of two-thirds of the power required to maintain the current, as proved by the experiment described on page 148 of our current volume.

As it is not the design to produce a vacuum, but simply to save the water of condensation for repeated use in the boiler, minute openings are made in the top of each condensing box so that the pressure within the box may always be just equal to that of the atmosphere upon the outside.

On trying the apparatus described, it was found that each foot of surface would condense one pound of steam per hour; the air entering at 60° and issuing at 90°. The experiment was so satisfactory that Mr. Hecker is going forward to construct an apparatus of this kind for his six engines. About 10,000 feet of condensing surface will be required.

PUBLIC INSTITUTIONS OF BOSTON.—We have received a copy of the seventh annual report of the directors of the public institutions of the city of Boston, which contains an emphatic and positive contradiction of the statements published in the various journals of the country concerning the treatment of prisoners and others. The directors say that the false assertions put forth were only instigated by the malice of some of the inspectors, and have no foundation in truth, and the directors aver that their standing in the community and honorable reputations as individuals are sufficient proof of the truth of their assertions.

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Slide Valve of Steam Engines.—In slide valve steam engines it is desirable, more especially in those of large size, to obtain a full opening of the port with the smallest practicable movement of the valve. To obtain this result it has been common to make the valve double-ported; but in making the valve double-ported, both for steam and exhaust, a difficulty has arisen, viz: the want of an effective mode of applying a cut-off, the arrangement of the ports having rendered it impracticable to apply a cut-off valve or valves riding on the back of the main valve. This invention consists in the combination with a slide valve which is double-ported, both for steam and exhaust, of a cut-off valve or valves riding directly on the back thereof. It also consists in a certain arrangement of the ports in such double-ported valve whereby the application of the cut-off valve or valves riding directly upon its back is made practicable. Isaac V. Holmes, of New York City, is the inventor of this improvement.

Seam-holder for Machine Sewing.—In sewing two or more thicknesses of cloth together by the sewing machine, the thickness which is near the feeding surface always tends to move faster than the other thickness, and the work is thus caused to be drawn. The object of this invention is to obviate this, and also to dispense as far as practicable with basting, and to this end it consists of a rod having attached to it two hooks or teeth, one or both of which are movable lengthwise thereon, so that by inserting the said hooks through the cloth and drawing them as far apart as possible they will keep the seam stretched even. The said seam-holder also obviates in a great degree the necessity of the operator reaching out to hold the work while sewing. George Fowler, of Waterbury, Conn., is the inventor of this improvement.

Baling Press.—This invention relates to an improved baling press of that class in which side levers are employed for operating the plunger. The invention consists in a novel and simple means for elevating the plunger at the commencement of its work whereby the levers at such time may be nearly or quite in a horizontal position, and several advantages obtained over the ordinary baling presses. The invention also consists in a simple means for ensuring a horizontal movement of the plunger, and also in an improved arrangement of the head or cover of the press-box whereby the filling of the latter and the removal of the bale therefrom is greatly facilitated. Peter Philip, of Hudson, N. Y., and Peter J. Stophilbeen, of Schodack, N. Y., are the inventors of this improvement.

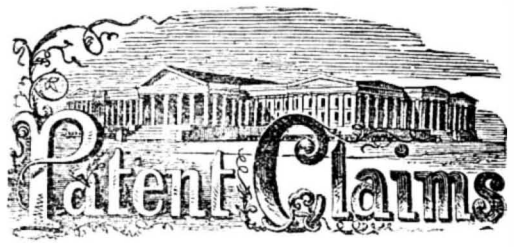
Percussion Fuse.—This invention relates to percussion fuses, the fulminate of which consists of a glass capsule which is filled with a liquid and the exterior of which is coated with or enveloped in a chemical substance which is caused to take fire by the contact of the liquid on the breaking of the capsule by the percussion produced by the striking of the projectile against any resisting body when fired from a gun. It consists in certain means whereby the capsule is prevented from being broken in the handling of or by the accidental dropping of the projectile, but its breakage is insured when the projectile strikes on being fired from the gun. George P. Ganster, of New York City, is the inventor of this improvement.

Sewing Silk.—In the manufacture of sewing silk it is essential that the strands or cords, while being twisted to form the thread, be of an equal thickness throughout and the cords or strands also kept at an uniform tension in order to form an even or uniform twist of the same. This has not hitherto been perfectly done and the sewing silk after manufacture is necessarily sorted and divided into several qualities according to the evenness or regularity of the twist. The reason for this imperfectness of the manufactured article is due in the first place to the stock, the irregularity in the imported thread, the filaments of which, as they are unwound from the cocoons are not matched and kept in an even state, filaments not being added to compensate for breakage and their gradual diminishing thickness as they are unwound from the cocoons. Another reason is carelessness in the matching operation, that is, the twisting of the cords or strands to form the thread of silk. The duty of the attendant of the matching frame consists in watching the cords or strands as they are unwound from the spools or bobbins and twisted, and if one cord or strand becomes thinner or thicker than another, to break it off and put another in its place equal in thickness to those on the frame. If this be neglected, and it almost invariably is to a greater or less extent, uneven thread is the result. To obviate these difficulties, the silk is subjected, after being twisted and moistened and before being deprived of its natural gum, to as great a state of tension as it will bear without danger of breaking, and thereby draws or stretches the several cords or strands to form an even and first quality of merchantable thread. J. E. Atwood & G. Holland, of Mansfield, Conn., are the inventors of this improvement.

Telegraph Register.—In all telegraph registers heretofore constructed, the style or steel pen is so attached to the pen lever as to be immovable laterally; and in order to write upon the paper in as many lines as practicable the paper has to be moved laterally and the working surface of the rollers has to be of a length almost equal to twice the width of the paper. As one of the rollers is pressed upon the paper by means of springs bearing on each end of the roller, every time the paper is moved laterally these springs have to be re-adjusted else the pressure of the roller will be greater on one edge of the paper than on the other, causing it to run untrue in its passage between the rollers. The main object of this improvement is to obviate the necessity of moving the paper laterally and thereby obviate the above difficulty; and to this end it consists in the arrangement of the style or pen in a holder which is movable in a direction parallel with the length of the rollers, by which means also the machine is enabled to be made much narrower, requiring less pinion wire for its construction, and the clock train is made to run more truly by reason of the axles being shorter. This movable pen necessitates the provision of several grooves in the roller against which the pen operates, instead of only one groove as in the rollers of the registers heretofore constructed, the said grooves corresponding in number and in distance apart with the lines of writing desired to be made on the paper; and the invention further consists in a certain mode of combining the movable pen-holder with the pen lever, and adjusting it relatively to the several grooves of the roller whereby the said pen is enabled to be brought exactly opposite to the said grooves and the lines of writing on the paper are always made at equal distances apart, so that a greater number of lines are enabled to be made upon the paper and the paper thereby economized. Robert Henning, of Ottawa, Ill., is the inventor of this improvement, which has been assigned in full to Judge Caton of the same place.

Saving Silver.—This invention consists in the employment or use, either in combination with the basin or sink into which persons using solutions of gold or silver suffer them to be wasted, or in place of said sink or basin, of a vessel so arranged and constructed that the waste solution while running through said vessel shall be brought in contact with such chemicals or metals which will cause the whole or any part of the silver or gold contained in said solutions to be precipitated and retained in said vessel, while the worthless material is allowed to escape; it consists further in the use of a partition or its equivalent in said vessel or sink, for the purpose of forcing the precipitated silver or gold to the bottom and preventing it from being drawn by the force of the current directly to the filter or outlet; it consists finally in the employment of a filter or its equivalent in combination with the sink or vessel in which the waste solution collects in such a manner that said filter will retain such particles of silver or gold, which might still float in the liquid after being brought in contact with the chemicals and passing under the partition. Jehyleman Shaw, of Bridgeport, Conn., is the inventor of this improvement.

SHUTTLES OF ALUMINUM BRONZE.—Messrs. Paul Morin and Co., manufacturers of aluminum at Paris, have just taken out a patent for the use of aluminum bronze in making shuttles.



ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING APRIL 5, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

42,151.—Corn Planter. John Agnew, Bath, Pa.:

I claim the sliding or adjustable crank-shaft, I, connected with the bar, G, of the slides, F F, by means of the pitmen, H H, in combination with the bar, J, provided with the beveled projection, d, the shaft, K, lever, M, and cranks, h h, connected with the furrow-openers, O, all being arranged to operate substantially in the manner as and for the purpose herein set forth.

[This invention relates to a new and improved seed-planter of that class which are designed for planting seed in hills and in check rows. The invention consists in a novel and improved seed-dropping mechanism with means for turning the same out of gear simultaneously with the elevating of the shoes or furrow-openers, whereby the seed-dropping drill is placed under the complete control of the driver, and is capable of being manipulated by him when the machine is being drawn along. The invention also consists in the employment or use of a marking device arranged and applied to one of the wheels of the machine, whereby the latter may always be started correctly at the commencement of each "bout" or movement across the field, and the seed planted in check rows so that the plants may be plowed the ways at right angles to each other.]

42,152.—Ambulance.—G. W. Arnold, Morgantown, West Virginia:

I claim an ambulance provided with couches suspended on pins, g g, which are attached to slides, H, the latter being fitted on vertical rods, I, and resting on spiral springs, J, substantially as herein shown and described.

I further claim attaching the side curtains, F, to rollers, C, substantially as described, to facilitate the raising and lowering of the curtains as may be required.

[This invention consists in a novel manner of arranging couches within the body of an ambulance, whereby the couches are retained in a proper position when the ambulance is passing over inclined ground, the couches being also allowed to yield or give vertically under the jarring movement of the ambulance, and all so arranged as to afford the greatest possible degree of ease and comfort to the wounded, while being conveyed from the field of battle to the hospital designed for their reception and future treatment. The invention further consists in a novel and improved arrangement of the curtains of the ambulance, whereby the former may be readily raised and lowered by the device, as the state or condition of the patients may require.]

42,153.—Manufacture of Sewing Silk;—J. E. Atwood & G. Holland, Mansfield, Conn.:

We claim the process of giving sewing silk an uniform or evenly twisted appearance by subjecting the same, after being twisted and moistened and before being deprived of its natural gum, to a requisite degree of tension in the manner substantially as herein set forth.

42,154.—Slide Valve for Steam Engines.—John Baird, New York City:

I claim the combination of a face plate with a slide valve by means substantially as described, whereby an endwise or lateral motion of the former causes its acting face to recede from or approach the back of the latter, substantially as set forth.

42,155.—Manufacture of Paper Pulp.—Lucien Bardoux, Poitiers, France. French patent dated June 7, 1861:

I claim the above described process of making pulp for the manufacture of paper and pasteboard, adapted to vegetable as well as animal substances.

42,156.—Treating Animal Charcoal.—Edward Beanes, London, England:

I claim the employment of hydro-chloric acid gas, and chlorine in a gaseous state, in the preparation and treatment of animal charcoal, substantially as and for the purpose herein described.

[The object of this invention is to convert, by the application of hydro-chloric acid and chlorine gas, the lime and other earthy and alkaline matters in the charcoal into soluble salts, without producing any important action upon the phosphate of lime contained in the charcoal. Mr. Beers can be addressed care of H. Medlock, 20 Great Marlborough street, London, England.]

42,157.—Ladies' Leggin.—Elizabeth F. & Sidney S. Bedford, Johnstown, N. Y.:

We claim the construction and arrangement of the ladies' leggin, as herein described and for the purposes set forth.

42,158.—Device for sewing Hat-linings in Sewing Machines.—Job W. Blackham, Brooklyn, N. Y.:

I claim, first, In combination with the operative parts of a sewing machine, the within described arrangement of the ways, a a, anti-friction wheels, b b, and traversing carriage, B, adapted to support the part which carries the hat tip, and allow it to rotate and slide freely back and forth, as herein specified.

Second, I claim in connection with the above the employment of the two ovals, E and F, arranged at right angles to each other and adapted to act on the wheels, G H, or their equivalents, so as to give a positive motion in both directions, substantially in the manner and for the purpose herein set forth.

42,159.—Method of expanding Tubes in Tube Sheets.—Reuel Blackwood, Philadelphia, Pa.:

I claim the employment of a hydraulic press provided with a head, a2, on its projecting main stem, a', in combination with the frustum of a cone, E, and a suitable clamp, F, arranged to operate together, substantially in the manner described for the purpose specified.

42,160.—Clothes-dryer.—H. S. Blood, New Orleans, La.:

I claim, first, The employment or use of a series of poles, D, fitted to a platform, C, or to any suitable fixture attached to a window-sill, in such a manner that said poles may be capable of being rotated for the purpose of winding the clothes upon them and unwinding the clothes therefrom, substantially as and for the purpose herein set forth.

Second, The segment or curved bars, k l, attached to the platform,

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C, and provided respectively with notches, l, buttons, m, and holes, l for the purpose of securing the poles, D, to the platform, as herein described.

Third, The combination of the brackets, A A, poles, D, and platform, C, the latter being provided with suitable fastenings for the poles, and all arranged to operate substantially as and for the purpose herein set forth.

[This invention relates to a new and improved device for hanging clothes from a window for the purpose of drying the former. The invention consists in the employment or use of brackets, such as are commonly used by painters to enable them to paint the outside of windows, in connection with a platform and also in connection with poles attached to the brackets, and arranged in such a manner as to be capable of being rotated, all the parts being so constructed, applied, and arranged, as to admit of the device being very readily applied to a window and removed therefrom, and also to admit of the wet clothes being suspended from the device, and when dry being removed from it with the greatest facility.]

42,161.—Heater.—Charles T. Boardman, Bergen Point, N. J.:

I claim, first, The combination of the horizontal deflectors, j, and vertical deflectors, k, with the boiler, A, annular flue, C, and deflector, D E, constructed, arranged, and operating as described.

Second, The combination with each other and with the boiler, A, and radiator, D D F, of the annular flue, C, casing, F, and deflector, i, substantially as and for the purpose herein set forth.

[The first part of this invention relates to tubular radiators applied upon or in connection with steam boilers for heating air for the supply of buildings or apartments, and it consists in a certain arrangement of deflectors in combination with an upright series of steam tubes, an upper steam chamber, and a surrounding air casing, for the purpose of conducting the air to be heated, among the said tubes and in contact with the whole of the surface of the said upper chamber. The second part of the invention consists in a certain arrangement of the flue of a boiler for steam heating, in combination with an air casing surrounding the boiler and radiator whereby the heat of the escaping gaseous products of combustion is economized, by using it partly to heat the boiler and partly to heat the air for the supply of the building or apartment.]

42,162.—Step Ladder.—William Eugene Bond, Cleveland, Ohio:

I claim the herein described construction of the side bars, A A, with step boards, B C E F, in combination therewith, and having their ends cut at continually varying angles, and by their union with each other causing a spiral or twisted form of the side bars in opposite directions, in the manner and for the purpose specified.

42,163.—Artificial Fuel.—Pierre Brusson, New York City:

I claim uniting anthracite coal dust with petroleum residuum to form blocks or lumps of artificial fuel as specified.

42,164.—Wind Wheel.—John P. Burnham, Chicago, Ill.:

I claim, first, The combination of the regulating sections, f, fixed sections, e, rings, 6, stationary boards, A, and regulating disk, E, all constructed and operating in the manner and for the purpose shown and described.

Second, The oblique slotted tube, j, and disk, E, in combination with the vertically sliding sleeve, k, and regulating sections, f, of the sails, D, constructed and operating as and for the purpose set forth.

[This invention relates to an improvement in that class of wind wheels in which the wind is conducted by a series of stationary boards to a wheel arranged on the interior of each board, and made to rotate on a vertical shaft.]

42,165.—Currier's Arm or Grain Board.—Amos Chase, Weare, N. H.:

I claim the construction of carriers' grain-boards with detached faces.

I also claim the flanges, a a, Fig. 1, the grooves, b, Figs. 2 and 3.

42,166.—Fence.—E. S. Clapp, Montague, Mass., & Emory Blanchard, Amherst, Mass.:

We claim the combination of the projecting pivoted loops, B B, stakes, C, and pivoted panel, A, all adapted to operate as herein described.

[This invention consists in constructing the panels of the fence of longitudinal strips attached parallelly to upright bars, a single nail or bolt passing through the strips and bars where they intersect each other, and connecting said panels together and securing them to the earth, by means of stakes which pass through metal loops or eyes attached to the ends of the panels, all being so constructed and arranged that the panels may, with the greatest facility, be adjusted in a straight line, or in a zig-zag or other form as desired, and on level or inclined ground, as circumstances may require.]

42,167.—Rock Drill.—John Cody, New York City:

I claim, first, Operating the drill, J, through the medium of the crank, a, cord, V, pinions, Q R, on the shafts, P S, the pinion, R, having a smooth portion, f, on its periphery, and the cords, N N, attached to the cross bar, K, and drums, O O, on the shaft, P, arranged substantially as set forth.

Second, The springs, X X, attached to the bar, K, and connected by the cords, Y, to the shaft, A′, having the pulley, C′, upon it provided with the cord and weight, b′ B″, substantially as and for the purpose specified.

[This invention consists in an improved mode of operating the drill as hereinafter fully shown and described, whereby the drill is operated or made to act against the rock with an uniform blow throughout the entire length of the hole to be drilled; the drill at the same time being rotated and fed to its work by an automatic mechanism.]

42,168.—Sleeping Garment for Travelers.—Virgil P. Corbett, Washington, D. C.:

I claim the combination of straps or cords, s s, with the collar, c, of a traveler's garment, as and for the purposes specified.

42,169.—Harvester Sickle.—Isaac C. Crane, Edgerton, Ohio:

I claim in the described combination with the finger-bar, A, fingers, B, and scalloped reciprocating blade, C D, the vibrating blades, E, pivoted at their front ends to the fingers, and at their rear ends to the reciprocating blade, substantially as represented.

42,170.—Belt Clasp.—Gustavus Cuppers, New York City. Ante-dated March 23, 1864:

I claim the construction and use of belt clasps formed as herein described, the material of the belt being bent at a right angle or nearly so between the lips, b1 b2, and the bodies, B and C, for the purpose herein set forth.

42,171.—Raking Attachment to Harvesters.—David Davis, Joseph Hiebeler, & Samuel A. Porter, Prescott, Wis.:

We claim arranging or suspending the cam, H, in a swinging bar, E, connected to a foot lever, K, by a cord or chain, h, in connection with the wheels, J B, attached respectively to the cam-shaft, F, and axle, a, of the driving wheel, B, all arranged as and for the purpose specified.

[This invention relates to a novel and improved raking device for harvesters, whereby the rake, by a very simple automatic mechanism, is made to sweep over the platform from its front to its back erect, and rake the cut grain therefrom, and is then elevated and moved forward in an elevated position over the platform, and above the grain falling thereon, to its front end at which point the rake is allowed to drop and then moved backward as before to perform the raking operation.]

42,172.—Cast-steel Mould.—John Deere, Moline, Ill.:

I claim the peculiar composition herein described for coating the interior surfaces of molds of dry sand to be used in casting steel into shapes.

42,173.—Grain-cradle.—D. D. Devoe, Ilion, N. Y.:

I claim the coupling band, D, with its set screw, E, in combination with the connecting rod, C, as and for the purpose herein described.

42,174.—Combined Measure and Funnel.—Samuel R. Dummer, New York City:

I claim the conical graduated measure and funnel combined, forming a new article of manufacture, as specified.

42,175.—Regulating Watches.—Charles Fasoldt, Rome N. Y.:

I claim in combination with the screw, d, the bow spring, C c1 c2, constructed and arranged substantially as hereinbefore set forth.

42,176.—Retarding blossoming of Fruit Trees.—Cyrus Fisher, Leesburg, Ohio:

I claim the process for retarding the bloom of trees, substantially as herein set forth and described.

42,177.—Corn Planter.—George W. Brown, Galesburg, Ill.:

I claim, first, In combination with the above described duplicate seed cups, i1 i2, the duplicate spring cut-offs, J1 J2, arranged substantially as represented, and for the purpose herein specified.

Second, I claim the fixed agitators, p1 p2, arranged to act in combination with the duplicate seed cups, i1 i2, substantially in the manner and for the purpose herein set forth.

42,178.—Corn Planter.—George W. Brown, Galesburg, Ill.:

I claim in combination with a series of duplicate seed cups, and duplicate stops, arranged substantially as above specified, the employment of the partial stop, z, arranged and operated substantially as and for the purpose herein set forth.

42,179.—Corn Planter.—George W. Brown, Galesburg, Ill.:

I claim in combination with duplicate seed cups, i1 i2, and a vibrating valve, N, operating substantially as described, the employment of the partition or division, M m, in the seed tube, adapted to serve substantially in the manner and for the purpose herein specified.

42,180.—Riding Stirrup.—Robert Nelson Eagle, Washington, D. C. Ante-dated March 21, 1864:

I claim, first, A stirrup frame of wood bent as described with arms meeting below their upper ends, and continuing upward in the form of a web or neck to afford means of applying or attaching the suspending strap, in any manner, substantially as described.

Second, A stirrup frame bent in proper form, with arms meeting at or near their upper ends and suspended by a strap, or its equivalent, passing through a slot or slots in the frame, or applied to the exterior thereof without the intervention of a metallic cap.

Third, An open hood or toe-piece, G, of leather or other material formed by pressure upon or within suitable dies, and having its lower end separate from the frame of the stirrup and provided with a horizontal corrugation or external convexity, g, to impart the required stiffness and strength.

Fourth, The use of one or more strengthening ribs or frames, in combination with a stirrup-hood or toe-piece.

42,181.—Bee-hive.—W. A. Flanders, Shelby, Ohio:

I calim, first, In combination with a dividing hive, constructed substantially as specified, bringing the comb frames by means of the extension hinge, E F, to the back or front walls, so that in opening the hive, the comb frames are brought out of the hive, in the manner and for the purpose set forth.

Second, I claim so hinging the back or front of a hive, and so attaching the comb frames thereto, that on opening the hive all the frames attached to one section may be swung out of the hive together, as and for the purpose specified.

Third, I claim in combination, the curtained tube, J, the division board, H, tube, H′, and glass, H″, operating as described for the purpose specified.

Fourth, I claim the queen and drone cages when constructed and operated as specified.

Fifth, I claim the disk, K, with the openings, 1 2 3 and 4, in combination with the openings, L, arranged and operating as and for the purpose set forth.

Sixth, I claim forming the joints of any position of the bee-hive that opens and shuts so that the angles and edges of the parts forming the joint or joints will not separate upon opening the hive or impinge upon each other when the parts are being closed, substantially as specified for the purpose set forth.

42,182.—Sleeping Car.—Ben. Field, Albion, N. Y., and Geo. M. Pullman, Chicago, Ill.:

We claim, first, The spring catch, F, arranged in the edge of the back, D, of a car seat, and operating in combination with the notched branches, e* e′*, of the hinged arms, E E′, substantially as and for the purpose specified.

Second, Making the arm, E′, out of two independently hinged branches, e′ e′*, as and for the purpose set forth.

Third, The extension braces, l, and grooved guides, i, in combination with the hooks, h, and with the platform, G, constructed and operating as and for the purpose described.

[This invention relates to certain improvements in that class of sleeping-cars in which the seats can be converted into a continuous couch, and a second tier of couches is provided by a platform which is raised to the roof of the car when not used, and lowered to a convenient hight when it is to be used.]

42,183.—Road-grading Machine.—Clinton Foster, Prairie City, Ill.:

I claim, first, The rotating, adjustable, and inclined wheel, E, provided with self-discharging buckets, F, in combination with a plow, I, said parts being attached to a framing, A, and all arranged to operate substantially as and for the purpose herein set forth.

Second, Giving the wheel, E, its self-adjusting movement by attaching the same to a bar, C, connected to the framing, A, by means of a hinge, B, substantially as herein described.

Third, Giving the buckets, F, of the wheel, E, a self-discharging movement by attaching them to the arms, b, of the wheel by means of hinges or joints, d, and connecting the buckets by chains, F, or their equivalents, to cranks, f, at the outer end of said rods, G, the inner ends being provided with cranks, i′, over which a cap, H, provided with a groove, k, and recess, l, is fitted, substantially as herein set forth.

[This invention consists in the employment or use of a rotating self-adjusting wheel provided with self-dumping buckets and attached to a frame or truck which has a plow connected with it; all being arranged in such a manner that as the machine is drawn along, the buckets of the wheel will, as the latter rotates, consecutively receive the earth thrown up by the plow and convey it around and discharge it at the desired point.]

42,184.—Cloth-holder for Sewing Machines.—George Fowler, Waterbury, Conn.:

I claim the seam-holder composed of a rod, A, and two teeth or hooks, b c, one or both of which are adjustable upon the said rod, substantially as and for the purpose herein specified.

42,185.—Percussion Fuse for Shells.—George P. Ganster, New York City:

I claim a percussion fuse composed of a screw-tube, A, closing cap, B, tube, a, thin tube, f, with attached annular plunger, b, globule, C, soft material, j, and shot or granular material, g; the whole united in the manner herein shown and described.

42,186.—Preserve Can.—John F. Griffin, New York City:

I claim the combination of a glass or other transparent stopper, with a metallic (or other opaque) can or jar, substantially as described for the purpose set forth.

42,187.—Metallic Boot, Shoe, or Sandal.—George W. Griswold, Abington, Pa.:

I claim a shoe or sandal made of metal, substantially as and for the purpose herein described.

42,188.—Closing or stopping Bottles.—Edward Hamilton, Chicago, Ill.:

I claim, first, The method herein described of bottling liquids or of stopping bottles containing liquid by the employment of an elastic impervious ball of a specific gravity greater than that of the liquid in combination with recessing or contracting the neck of the bottle in such manner that the ball when let from within the bottle into the neck will be held therein by pressure upon its circumference.

Second, The method of bottling still liquids or of stopping or closing the bottles, containing or designed to contain liquids not charged with gases or liquids charged with gases whose pressure is inadequate to effect the closing of the bottle automatically by the expansion of the gases within it, by forcing an elastic impervious ball which the bottle contains into its seat in the recessed or contracted neck of the bottle by suction.

Third, In bottles to be closed from within by means of a ball I claim forming the seat of the ball in the neck of the bottle by so contracting the outlet as to present a conical spherical or other impinging annular surface or surfaces to the ball.

Fourth, Combining with an internal stopping ball, a bottle with a short and recessed or contracted neck, that is to say a neck whose recessed or contracted ball seat is as near to the rim or outlet as practicable in view of the strength requisite.

Fifth, Closing bottles containing an elastic impervious ball lighter than the liquid to be bottled, by filling such bottles with the liquid and by then forcing air or other gaseous fluid into them.

42,189.—Railroad Car Brake.—O. J. Harrington, Manchester, Pa.:

I claim, first, The combination of the friction pulley, m, and shaft, 2, lever, o, drum, n, pulley, g, and chains, r and y, when used in connection with car brakes, arranged and operating in the manner herein described and set forth.

Second, The use of the chain, y, adjustable pulley block, 6, and chain, h, when used in combination with a lever for each brake and so arranged that the brakes will act independent of each other, as herein described and set forth.

Third, The arrangement of the pulleys, t z and g, chain or cord, s, chain, r, lever, o, shaft, 2, friction pulley, m, drum, n, chains, y and h, adjustable pulley block, 6, levers, g, furnished with cams, 10, and brakes, k, arranged and operating substantially as herein described and for the purpose set forth.

42,190.—Construction of Vessels.—Louis Hein, New York City:

I claim a vessel constructed with ribs, B a b, of angle-iron, a water tight wooden casing, C, strengthening and protecting the said ribs and an external planking or sheathing, D, all as herein specified and for the purposes explained.

42,191.—Slide Valve for Steam Engines.—Isaac V. Holmes, New York City:

I claim, first, The combination with a slide valve which is double-ported both for steam and exhaust, of a cut-off valve or valves riding directly on the back thereof, substantially as herein specified.

Second, The construction and arrangement of the several ports of a double-ported valve, substantially as described, whereby the steam exhausted through two of the exhaust ports, e e′, may pass the inner steam ports, b b′, on its way to the main exhaust port, substantially as herein described, and all the steam ports are brought into the back of the valve so that a cut-off valve or valves may be applied to ride directly thereon, substantially as herein specified.

42,192.—Grain Drill.—Augustus Hoffman, Half Day, Ill.:

I claim the lever, Y, in combination with plate, q, supports, U and V, branch lever, O, and wheels, R, the whole constructed and operated substantially as herein described.

42,193.—Mode of connecting Trucks to Locomotives.—Wm. S. Hudson, Paterson, N. J.:

I claim, first, An arm, B, extending rearward from the truck, and confined between limits so as to allow a slight freedom for the swiveling motions of the truck, substantially as and for the purpose herein set forth.

Second, I claim in combination with the above the employment of the link, G, pivoted to the rear end of the arm, B′, and to a fixed point, H, upon the body of the locomotive, and arranged to operate substantially in the manner and for the purpose herein set forth.

Third, I claim in combination with the limited freedom for vibrations of the arm, B′, the employment of the cross parts, m and N, adapted to allow a limited freedom for vertical vibrations or oscillations of the truck, substantially as and for the purpose herein set forth.

Fourth, I claim in locomotives the employment of the intermediate piece, C, or its equivalent, connected by a swivel joint to the truck, and arranged to operate substantially as and for the purpose herein set forth.

42,194.—Standard for Lumber Cars.—Henry Jacob, Loretto, Pa.:

I claim hinging or pivoting the standards to a lumber or platform car, so that they may be raised up into place when required, and swung or folded down out of the way when not required, substantially as herein described.

42,195.—Steering Apparatus.—Daniel Jones, Boston, Mass.:

I claim, first, The combination of the shaft, G, wheel, i, pinion, i′, screw, H, nut, f, and sleeve, g, in the manner and for the purpose specified.

Second, The auxiliary tiller, S, constructed and operating substantially as described.

42,196.—Corn Planter.—Samuel F. Jones, St. Paul, Ind. Ante-dated April 2, 1864:

I claim, first, Operating the seed slide, S′, through the medium of the crown wheel, C, movable lever, a, adjustable pin plate, n′, vibrating slide, b, spiral spring, S, and lever, o′, the whole being constructed and arranged to act conjointly as shown and described for the purpose set forth.

Second, I claim the agitator, n, when constructed and operated as shown and described.

Third, I claim the hub, T, with arms, 4 5 6, when used in connection with the crown wheel, C, as shown and described for the purpose set forth.

42,197.—Harvesting Machine.—W. H. Jordan, Roseville, Ind.:

I claim the arrangement of the cutting mechanism, apron, R, and arms, h, with the thrashing cylinder, T, apron, V, and shoe, Y, all in the manner herein shown and described.

[This invention relates to a new and improved machine for cutting standing grain and thrashing it simultaneously. The object of the invention is to obtain a simple and efficient machine for the purpose specified, and one which will admit of the thrashing apparatus being used separately when required. Mr. Jordan's address is 38 Bank street, New York.]

42,198.—Window-blind and Curtain Fixture.—John H. Kinsman, Westchester, N. Y.:

I claim the combination of the eccentric, C, acted upon by the cord, A O, through the medium of the lever, D, or its equivalent, the elastic opposing surface, B, the spring, E, for the purpose of retaining in position the cam, C, either when the said cam is retaining the cord in place or allowing it to pass, as and for the purpose specified.

42,199.—Carriage Circle Coupling.—George G. Larkin, West Amesbury, Mass.:

I claim connecting the two side arcs, J J, of the lower circle by means of the depressed arc, K, in combination with the stop, M, substantially as set forth and for the purpose described.

42,200.—Machine for cutting Paper.—Hervey Law, Chatham, N. J.:

I claim the combination of a lever, F, with the knife and the rack and pinion, substantially in the manner and for the purpose herein shown and described.

[This invention consists in the employment or use of a straight knife arranged to operate with a drawing or oblique cut and through the medium of a lever as herinafter set forth, whereby a powerful and compact paper-cutting machine is obtained and one simple in construction and not liable to get out of repair. The invention also consists in using in connection with the knife aforesaid, a clamp arranged in a simple and novel way, to be capable of being adjusted with facility to hold firmly the paper in position while being cut and to aid the operation of the knife. The invention further consists in the employment or use of a gage so arranged as to be capable of being adjusted by the operator from the front side of the machine.]

42,201.—Clamp Milling Machine.—A. B. Lawther, Stonington, Conn.:

I claim, first, The combination of the cutter, C, and rest, D, con-

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structed, arranged, and operating substantially as and for the purpose set forth.

Second, The rest, D, having its surfaces, d e, arranged substantially as herein described in relation to each other and to the line of motion of the cutter, substantially as herein specified.

Third, The surface, f, of the rest, arranged relatively to the cutter, substantially as and for the purpose herein specified.

[The clamp milling machine to which this invention relates is commonly used for "sizing" such articles as gun-screws and barrels, center pins for pistols, ramrod heads, &c., and other round work which requires to be duplicated and which does not specially require to be turned in lathe centers. The object of the improvement is to allow the same tools to be used for cutting various sizes and to prevent the work from rolling out when being operated upon; and to this end it consists principally in the combination of a single cutting edge and an opposite rest to confine the work to said edge.]

42,202.—Truck for Street Railways.—Robert H. Lecky, McClure, Pa.:

I claim, first, The combination of the swivel bearings, 6 and 20, when used in connection with the axles, l, wheels, J, disks, m, connecting rod, 19, levers, s and t, and shaft, r, constructed, arranged and operating substantially as herein described and for the purpose set forth.

Second, Securing the tongue, a, to the bottom, b, by means of the flanged tube, XI, and support, X, as herein described and for the purpose set forth.

Third, The use of the catch, 17, and guide, g, when used in combination with the tongue, a, flanged tube, XI, bottom, b, and lever, b′, arranged, constructed, and operating substantially as herein described and for the purpose set forth.

Fourth, The arrangement of the brakes, z, cups, w, plungers, v, and levers, 9 8 18 and 12, arranged, constructed, and operating substantially as herein described and for the purpose set forth.

42,203.—Steam Wagon.—Robert H. Lecky, McClure, Pa.:

I claim, first, The use of the swivel bearings, w, or their equivalents with their axis placed central to the periphery of the wheels so that said wheels may be turned sideways without any back or forward motion, other than that imparted by the engines and driving gear, as herein described and set forth.

Second, The arrangement of the wheels, a 1 2 3 4 5 and 6, endless chains, 16, crank shafts, 8, spring bars, b′, and eliptic springs, o, arranged and operating substantially as herein described and for the purpose set forth.

Third, The arrangement of the shaft, 18, furnished with drums, n′ v′, and wheels, o′; wheel, 17, swivel heads, z, and tiller ropes, A B C D and E, when used in connection with the axles, v, swivel bearings, w, and wheels, a, arranged and operating substantially as herein described and for the purpose set forth.

42,204.—Burner for Oil Lamps.—John G. Leffingwell, Newark, N. J.:

I claim, first, Expanding the bottom end of a wick-tube so as to make the outside shell of a burner and wick-tube of one piece of metal, as described.

Second, I claim expanding the bottom end of a wick tube so as to enclose the ratchet wheels of a burner, as described.

42,205.—Grain Separator.—Silas F. Lefler, Racine, Wis.:

I claim, first, The segment projections or rockers, j j, attached to the sides of the screen, F, in combination with the rods, g h, and lever, H, the latter being operated by the connecting rod, G, and crank pulley, d, from the fan shaft, a, all arranged substantially as and for the purpose set forth.

Second, The inclined board, N, applied to the case, A, as and for the purpose herein specified.

Third, The combination of the cleets, g g, connecting board, M, and sliding board, M′, constituting a movable frame applied beneath the riddle, o, in the manner and for the purposes described,

Fourth, The adjustable buttons, b′, secured within the shoe, L, for the inner end of the board, M′, to rest upon, for the purpose specified.

[The invention relates to a new and improved grain separator, designed for the use of farmers and to separate oats and grass-seed from wheat, and also to separate the first from the second quality of wheat, all being effected at one and the same operation and by an extremely simple arrangement of means.]

42,206.—Cotton Gin.—Wm. H. Livingston, New York City:

I claim actuating the board or plate that receives the ginned cotton from the ginning cylinder automatically and positively in order that it may be drawn or swung away from said cylinder at regular intervals for allowing the accumulated cotton to pass away, as specified.

I also claim a row of teeth or pins combined with the ginning roller, when the said pins are retracted at the time of delivering the cotton, as specified.

42,207.—Postage and Revenue Stamps.—Henry Loewenberg, New York City:

I claim a postage, revenue or other stamp produced by printing on size, applied to paper or other material to prevent the penetration of the ink, and applying the adhesive material to the opposite side of the paper, so that when the said stamp has been attached to a letter or other document and cancelled by over-printing in the usual way, the cancellation marks cannot be removed without destroying or defacing the print.

[This invention relates to a stamp which, having been cancelled by overprinting or in any other way, will not permit the removal of such cancelation marks without destroying the print.]

42,208.—Labels intended for Second Use.—Henry Loewenberg, New York City:

I claim an adhesive label formed of paper or cloth prepared in the manner described to prevent the penetration of the adhesive substance by which the label is to be attached and thus adapt the said label to be applied and removed as often as desired without destroying it.

[This invention consists in coating paper, cloth, or other material with wax or resin, or any material which is impervious to the gum or mucilage used in attaching labels to articles of commerce, &c. The label thus made is readily detached and may be repeatedly used without being destroyed.]

42,209.—Curd-cutter.—James B. Lyons, Milton, Conn.:

I claim the vibrating cutters, b b b b, in combination with the stationary right angle cutters, a a a a, and the compresser or hand follower, C D, operating substantially in the manner as and for the purposes herein set forth.

42,210.—Apparatus for upsetting Tires.—Samuel Martin, Parshallville, Mich.:

I claim the use of a fulcrum key, c′, and one or more filling pieces, c c c, in combination with a cam or eccentric for the purpose of graduating and limiting at pleasure, by a fixed scale, the movement of the cramping blocks or hold-fasts, A and B, of a tire-upsetting machine, substantially as is herein set forth.

I claim also the combination of a shaft, H, and eccentric, S, with the cramping blocks, A and B, of my improved tire-upsetting machine when said blocks, A and B, are made to operate conjointly by means of a coupling bar, D, constructed substantially in the manner and for the purpose herein set forth.

42,211.—Channeling Machine.—Gordon McKay, Boston, Mass.:

I claim applying a feeding device to operate against the edge of the sole, in combination with a feed-wheel or wheels which operate against one or both surfaces of the sole, substantially as set forth.

I also claim so combining the presser bar, N, with the presser roll and with the feed-wheel, that the operation of the presser bar will be substantially as described.

42,212.—Manufacture of Siding.—Henry Millingar, Pittsburgh, Pa.:

I claim the method herein described of producing rebated siding boards, which consists in first grooving both edges of the stuff and then slitting it obliquely between the grooves, all as set forth.

[This invention relates to a new and useful improvement in the manufacture of siding for frame buildings. The object of this invention is to economize in the manufacture of the same, and at the same time produce equally as good an article as that manufactured on the old plan.]

42,213.—Apparatus for forcing Oil from Wells.—James Molyneux, Bordentown, N. J.:

I claim the combination with the pipe, D, of an artesian oil well, of an internal pipe, C, between which and the pipe, D, intervenes a space, when the said pipe, D, is so connected with a pump or engine as that compressed air or steam may be introduced and oil thereby expelled from the inner pipe, all substantially as shown and described.

42,214.—Vapor Stove.—Oscar F. Morrill, Chelsea, Mass.:

I claim the combination of the insulator, E, with the conduit, D, and the stand, A, of the apparatus.

Also the improved apparatus for supporting vessels or articles to be heated by the aero-vapor burner, the same consisting not only of the removable boiler-supporter, K, with series of cap rings and cover, but the stand, A, as made with the perforated casing, I, the whole being arranged substantially in manner as described.

42,215.—Port-hole Closer.—J. V. Murray, Brooklyn, N. Y., and Charles Borst, New York City.

We claim the application of the lever E, provided with a lip d, and loop e, or their equivalents to operate in combination with the rope D, and shutter C, in the manner and for the purpose substantially as herein shown and described.

This invention consists in the application to a port-hole shutter of a hinged lever provided with a lip or stop to retain it in a position at right angles with the surface of the shutter, in combination with the rope which serves to raise the shutter in such a manner that by pulling said rope the lever is first raised to a position at right angles with the surface of the shutter and a purchase is obtained whereby the shutter can easily be started from the vertical position and brought up and closed with much less exertion or power than it requires to start or raise the same when the rope extends from the edge of the porthole directly to the end of each shutter.

42,216.—File-cutting Machine.—Wm. T. Nicholson, Providence, R. I.

I claim, first, The method substantially as described of imparting motion to the feeding mechanism in a file-cutting machine by the combination of a pawl and ratchet gear or its equivalent with the bands f, f, operated by the revolution of the main shaft in the manner substantially as specified.

Second, The combination of the feeding mechanism and the movable carriage upon which the blank is held during the cutting-operation in a file-cutting machine by the means substantially as described for the purposes specified.

Third, Imparting a variable rate of motion to the carriage upon which the blank is held by the method and on the principle substantially as described for the purposes specified.

Fourth, The combination of a spring or springs O′, which can be torsionally strained as shown, with the mechanism for varying the tension of the same substantially as described for the purposes specified.

Fifth, The combination of a spring or springs O′, which can be torsionally strained as shown, with the mechanism consisting of the slotted arm O″. and the worm gear k, m, or the equivalent of the same for adjusting the tension of the spring or springs within limits which will best give the proper degree of impulse to the cutting chisel, substantially as described.

Sixth, The combination of a spring or springs O′, which can be torsionally strained as shown with the carriage, B′ B′, or other device which carries the cutting chisel substantially as described.

Seventh, The method of arresting the action of the cutting chisel at any previously determined point in the progress of the blank under the cutter by the combination of a spring stop (Fig. 5) substantially as described with an adjustable inclined plane upon the movable carriage as herein specified.

42,217.—File-cutting Machine.—Wm. T. Nicholson, Providence, R. I.:

I claim the method substantially as described of regulating the position of the rolling bed of a file-cutting machine by means of equalizing springs or their equivalents applied and operating substantially as herein specified.

42,218.—Street Pavement.—Lewis F. Noe, New York City:

I claim the combination and arrangement of the nails or spikes, B, with the stones or blocks, A, of a Russ or block pavement substantially as and for the purpose set forth.

42,219.—Ladder.—Edward F. Olds, Lyon, Mich.:

I claim, first, The sections, A, and B, B, when united by the splice piece, F, and secured in an extended form by the round E, as specified.

Second, I claim the extension brace, G, H, when used in combination with the sections, A, B, as and for the purpose set forth.

Third, I claim the platform, O, when constructed and used as described

42,220.—Plow-handle.—S. J. Olmsted, Binghamton, N. Y.:

I claim the metallic hand-handle for plows, and other agricultural implements having a rein-hole therein and constructed substantially as herein recited.

42,221.—Cooking Stove.—John Park, Joliet, Ill.:

As a new article of manufacture I claim the cooking cup-board herein described, all constructed and arranged substantially as herein specified and shown.

42,222.—Planking Screw.—Abram Perrin, Cleveland, Ohio:

I claim the bar, A, arms, B, B′, fulcum, C, lever, E, screws, F, and H, the several parts being arranged and operating as and for the purpose specified.

42,223.—Baling Press.—Peter Philip, Hudson, N. Y., and P. J. Stophilbeen, Schodack, N. Y.:

I claim, first, the employment or use of a pendent pulley or bracket H, or its equivalent, arranged relatively with the plunger, B, rope, I, levers, C, C, and the pulleys, F, F, or equivalent rope guides, so as to throw up the plunger B, when the latter is at the bottom of the press-box and the levers, C, C, in a horizontal position as set forth.

Second, The strips or bars, d, d, attached to the plunger, B, at two opposite sides thereof in combination with the vertical slots, c′, c, in the sides of the press-box, A, all arranged substantially as and for the purpose herein specified.

Third, The combination of the box, B, head or top, K, hinge, L, and fastening, N all constructed, arranged and operating as specified.

42,224—Roller for Wringers.—Joseph F. Pond, Cleveland, Ohio:

I claim the application of canvas cloth, or other material for the purpose of repairing, covering, and protecting torn, defaced and soiled india-rubber clothes-wringer rollers, and to prevent the shaft from turning or getting loose in the roller as and for the purpose herein set forth.

42,225.—Heater.—John S. Reid, Muncie, Ind.:

I claim in the described combination, the heat reservoir, E, air chamber, F, air inlets, G, oblique air ducts, H, and conical deflector, J, as herein described.

42,226.—Wool Flannel.—J. F. Rich, Chatham Run, Pa.:

As an improved article of manufacture, I claim a flannel composed and made in the particular manner herein set forth.

[This invention consists in a new kind of flannel in which hard twisted yarn is presented in one surface for wear, and a softer yarn to the other surface for warmth, such flannel being made by using a harder or more twisted yarn for the warp, and a softer or less twisted yarn for the weft, and weaving in such a manner as to throw the greater portion of the warp on one side, and the greater portion of the weft on the other.]

42,227.—Breech-loading Fire-arm.—A. H. Rowe, Hartford, Conn.:

I claim the combination and arrangement of the switch groove 2, and its projection connecting the two grooves 1 and 3, and operating therewith and with the ejector, l, m, n, as herein described and represented, for throwing out the empty cartridge case in the act of turning the barrel to reload it as set forth.

I also claim the prolongation of the trigger guard, as shown at i, for the purpose of forming and inserting it as a spring between the hammer and breech-piece to start back the hammer after the discharge, in the manner and for the purpose described.

42,228.—Elastic Cushion for Piercing Implements.—Benjamin Davis Sanders, Wellsburgh, West Virginia:

I claim as a new article of manufacture, an elastic cushion for piercing instruments substantially as and for the purpose described.

42,229.—Roof of Railroad Cars.—O. P. Scaife, Pittsburgh, Pa.:

I claim, first, The means substantially as described and represented for sustaining the arched corrugated metallic roof A, and connecting the same to the car body, the whole being arranged as herein represented.

Second, The combination of angular knees, tie rods, adjustable T, struts, corrugated roof and car body, substantially as described.

42,230.—Square and Bevel combined.—George A. Shelley, Madison, Conn.:

I claim the combination of the square, B, screw-pivot, e, and slotted stock, A, all arranged and operating substantially as and for the purpose herein shown and described.

[This invention consists in a square attached to an ordinary slotted stock by means of a screw pivot in such a manner that said square can be turned on the pivot and set in any desired position in relation to the stock and either arm of the square can be used to draw lines in an oblique direction to the edges of the stock, or if desired the square can be converted into and used as a T-square.]

42,231.—Water-proof Compound and Varnish.—Edwin L. Simpson, Bridgeport, Conn.:

I claim the varnish or compound produced by combining sulphur with vegetable oil (made drying in the manner substantially as described) substantially in the manner and for the purpose as herein specified.

42,232.—Cultivator.—Seymour Sloan, Kewanee, Ill.

I claim the combination of the beams B, B, C, C, connecting bars D, D′, E, F, G, levers, c, c, treadles H, and bent levers, H′, all constructed, arranged, and operating in the manner and for the purposes herein specified.

42,233.—Locomotive Steam Engine.—Albra F. Smith, Norwich, Conn.:

First, I claim in locomotives, transmitting motion from the crank shaft, A, to the bearing wheels, R, through the medium of the friction wheels. V T, so arranged as to be both out of contact with the rails as herein set forth.

Second, I claim in connection with the above mounting the bearings of the driving axle, A, in the same pedestals with the bearings of the driving axle, T, in the same pedestals with the bearings of the driven axle, t, substantially as and for the purposes herein set forth.

Third, I claim the employment in locomotives of a slight clip or catch, Z, arranged relatively to separate hand levers, J, j, or their equivalent connected each to the same starting and controlling mechanism substantially in the manner and for the purpose herein set forth.

Fourth, I claim in locomotives, so constructing and arranging the tanks W, W′, that they are of little width but greatly extended in longitudinal and vertical dimensions and are rigidly framed together and to the framing Q, Q, or its equivalent substantially as and for the purposes herein set forth.

Fifth, I claim in locomotives so constructing and arranging the said tanks W, W′, that they are of little width but greatly extended in longitudinal and vertical dimensions and are mounted outside of the working gear substantially as and for the purposes herein set forth.

42,234.—Car Ventilator.—A. B. Spencer, Rochester, N. Y., Ante-dated March, 28, 1864:

I claim, first, The dust pan or cinder collector constructed and operated as shown by Fig. 4, and herein described.

Second, the arrangement of the rectangular mouth b, with the deflecting surfaces, f, and g, as described.

42,245.—Registering Dies.—Edward Spencer, St. Louis, Mo. Ante-dated March 23 1864:

I claim, first, In combination with the stationary die which I have called the block or frame, R, the movable monthly registering die, A, and the two movable dating dies, B, B, substantially in the manner described.

Second, In combination with the stationary die, R, the movable numbering die or dies D, whether there be one, two or three of said dies to mark the number of trips as set forth.

Third, In combination with the stationary die, R, the movable or adjustable die, C, which marks the year, substantially as set forth.

Fourth, The combination of the monthly registering die, A, the numbering dies, D, and the dating dies, B, B, with the stationary die R, substantially as described.

Fifth, I claim the combination of the die, C, which marks the years, whether it be movable or stationary, with the numbering dies, D, the monthly die, A, and the dating dies, B, B, arranged in a stationary die as in the block, F substantially as set forth.

42,238.—Vise.—Anson P. Stephens, Brooklyn, N. Y.:

I claim the toothed bar, C, with jaw, D, attached in connection with the toggle, G, toothed bar, H, and the lever, B, and cam, E, or their equivalents, for operating the toggle all arranged substantially as and for the the purpose set forth.

I also claim the hook, F, on the lever, B, when used in connection with the toggle, G, and toothed bars C, H, for the purpose specified.

I further claim the hook projections, g, g, on the part, d, of the toggle in connection with the projections, h, on the part, d′, thereof for the purpose set forth.

[This invention relates to an improved vise of that class which are placed on benches or supports, and are commonly termed bench-vises. The objects of the invention is to obtain, by a simple arrangement of mechanism, a vise of the class specified, which will admit of its sliding or adjustable jaw being quickly adjusted to the work or article designed to be held by it, and at the same time admit of the work or article being firmly grasped and held in the vise.]

42,237.—Channeling Machine.—Curtis Stoddard, North Brookfield, Mass.:

I claim so applying the channeling cutter to the head N, in which the pressure roll I, is journalled that the contract of said roll with the surface of the sole shall guage the depth of cutting action of said channeling tool.

I also claim the construction of the feed wheel, C, whereby from the disposition of the teeth, a, they are kept from contact with the edge of the sole as set forth.

42,238.—Butter-worker.—Almon Swift, East Hmore, Vt.:

I claim the combination of the shaft. B, conical roller C, and a fastening, g, or its equivalent, so arranged as to render the roller C, fast or loose on the shaft, B, at pleasure substantially as described.

42,239.—Wrench.—Chas. R. Thorn and Alfred Leigh, Clinton Station, N. J.:

We claim, first, The double set of jaws, b, b,* applied to the disks B, B′, in the manner and for the purpose substatially as specified.

Second, The disks, B, B′, each provided with a stationary jaw, b, and with a movable jaw, b*, moving in an oblique recess, c, in combination with the ratchet wheel, D, handle, E, and pawl, g, constructed and operating in the manner and for the purpose substantially as shown and described.

[This invention consists in a wrench with a double set of jaws, one for right and the other for left handed work, or one for tightening, and the other for unscrewing a nut or screw in combination with a ratchet wheel pawl and handle, in such a manner that the operation of tightening or unscrewing a nut or screw can be performed with the same wrench and without removing the jaws from such nut or screw until the operation is finished.]

42,240.—Heat-governor for Stoves.—Albert H. Tingley. Providence, R. I. Ante-dated March 30, 1864:

I claim, first, The expansion tube, F, and their enclosed rods, H, in connection with a lever, J, or any equivalent device for operating a valve or damper, N, for the purpose specified, by which the latter is adjusted solely by the expansion and contraction of the tubes, F, no counter-poise or weight being employed.

Second, The lever-plate, I connecting the two rods, H, H, when used in connection with the tubes. F. for the purpose specified.

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Third, The adjustable bar, K, or its equivalent interposed between the lever, J, and rod, L, for the purpose of controlling the action of said lever on the rod, L, and valve, N, as set forth.

Fourth, The employment or use of the valve, N, interposed between the ash-box and a passage communicating with the smoke-pipe and placed within a suitable box, B, provided with openings b', substantially as shown or in any equivalent way to operate as set forth.

Fifth, Placing the arm, s s, of the valve between the plates u, u', substantially as shown for the purpose of facilitating the adjusting of the valve, N, in the box, B.

Sixth, Adjusting the bar, K, through the medium of the arbor, P, index, Q, and graduated dial, R, as set forth.

Seventh, The adjustable plate, S, placed on the arbor, P, when used in connection with the index, Q, as and for the purpose specified.

Eighth, The partition plate, a, in the valve box, B, in connection with the slot, c', in the valve, N, whereby one valve is made to answer for both compartments of the box B, as set forth.

[The object of this invention is to obtain a simple and efficient self-acting heat-governor for stoves and hot-air furnaces—one which will admit of being adjusted in such a manner as to govern the heat according to the state or temperature of the weather, and which may be adjusted properly to thus act or operate by any person of ordinary ability.]

42,241.—Cane-stripper.—William Todd, Barnsville, Ohio:

I claim the within described process of stripping the leaves from the stalks of sorghum or sugar cane by compressing a quantity of cane by means of ropes, b, and weights, c, or their equivalents, and drawing one stalk after the other out of the bundle substantially in the manner shown and described.

[This invention consists in stripping the leaves from the stalks of sorgham or sugar cane by compressing firmly a quantity of canes into a large bundle and pulling one stalk after the other out of the bundle, the pressure being kept up continually by weights or their equivalent, so that by the act of pulling out the stalks the leaves are stripped off and the operation of stripping can be performed with much less trouble and labor and more perfect than the ordinary manner.]

42,242.—Water Wheel.—Wm. L. R. Valentine, Fort Edward, N. Y.:

I claim the wheel D, constructed with two sets of buckets, F, F', one set being above the other, and the upper set, F, formed at their face sides, with a straight triangular surface, d', and a concave surface, d, and the lower set F', formed with concave face sides, in combination with the conical lower plate, a, of the wheel, and the scroll, A, all arranged as herein set forth.

[This invention relates to an improved water wheel of that class which are fitted on a vertical shaft, and are commonly termed horizontal water wheels. The invention consists in the employment or use of two sets of buckets constructed of such a form and combined with a scroll in such a manner as to obtain a large per centage of the power of the water. The invention also consists in the employment or use of a wicket or gate within the scroll, arranged in such a manner as to admit of the escape of drift, mud, or other solid substances which may pass into the scroll, thereby avoiding the breaking of the buckets, a contingency of frequent occurrence in this class of wheels.]

42,243.—Water-heater for Steam Boilers.—H. N. Waters, Hartford, Conn.:

I claim the arrangement of the tank, A, with the exhaust pipes, E, and D, and the distribution of the water through the cone-shaped attachment, in juxta-position to the exhaust pipe, D.

42,242.—Machine for sawing Heading for Barrels.—Peter Welsh, Oswego, N. Y.:

I claim, first, the combination of the shaft, S, pinions, V, and W, (with their clutch jaws, a, and d,) double clutch, b, c, fork lever g, and racks e and f, substantially in the manner and for the purpose described.

Second, The feed mechanism of the carriage, y, consisting of the racks, i, pinions, j, ratchet wheel, j', pawl, arm, m, and guide, n, arranged for conjoint operation in the manner specified.

Third, In combination with the carriage, y, the dogs, o, and p, lever t, and arc, v, arranged and operating substantially as set forth.

Fourth, In combination with the lever, g, the hooks, y, and z, and the springs, a' and b', arranged and operating substantially in the manner described.

42,245.—Piston Packing.—Jerome Wheelock, Worcester, Mass.:

I claim the segmental packing rings, D, E, constructed in the manner and for the purpose set forth and described.

42,246.—Sawing Machine.—O. A. White and J. W. Bostwick, Norwich, Ohio:

We claim, first, The combination and arrangement of levers, D and D' F G and H, and ratchet, E, constructed and operating substantially as specified and for the purposes set forth.

Second, The combination and arrangement of arm, K, cord, k, and lever, L, as and for the purposes set forth.

Third, The combination and arrangement of slide, O, cord, P, and lever L, constructed and operating as and for the purpose described.

42,247.—Paper Case Envelope.—J. W. Wilcox, New York City:

I claim the pieces of wood, A A, fastened to the ends of the envelope, as and for the purpose shown and described.

42,248.—Harvester.—C. P. Wing, Fayetteville, N. Y.:

I claim, first, The pins or projection, S, in the shaft, N, in combination with the pin or projection, in the wheel, O, for the purposes specified.

Second, I claim the spring guard, L, for the purpose of protecting the standing grain or other material outside of the shoe, B, from the knife, V, and those following, as described and specified.

42,249.—Lantern.—F. W. Woodward, New York City:

I claim a lantern provided with a glass flame protector or globe, cylinder, or other form, in one piece, with a metal cap and base secured to its ends by a screw or other equivalent fastening which will not require the aid of plaster of Paris or cement of any kind, substantially as and for the purpose set forth.

I further claim, in combination with the mode of connecting the metal cap, base and glass flame protector, as described, the guards, D, attached to the cap at their upper ends and secured at their lower ends to a band which encompasses the lower part of the flame protector, substantially as set forth.

[This invention relates to an improvement in that class of lanterns which are provided with glass flame protectors of spherical, cylindrical or other form, in one piece, instead of detached glass planes for protecting the flame of the lamp from the wind. These flame protectors of the kind first mentioned, have hitherto been attached to their metal caps and bases by means of plaster of Paris or other suitable cement, and in case of the breaking of a protector a new one cannot be placed in the metal frame by any one except a mechanic or one skilled in the manufacture of lanterns. Hence, in a majority of cases, when a protector gets broken, the remaining metal parts are thrown away as useless. The object of this invention is to attach the metal cap and base to the protector in such a manner that the parts may be connected together and attached by any one with with the greatest facility, no cement of any kind being required, and hence in case of the breaking of a glass flame protector a new one may be adjusted to the metal parts without the aid of a mechanic.]

42,250.—Turning Lathe.—L. D. Wynkoop, Owasso, Mich.:

I claim the bearing, F, provided with the knives, H Q, and attached to a sliding frame, D, on the lathe bed, C, in combination with the rising and falling bar, I, to which the knife, Q, if attached, the loaded lever, K, connected to bar, I, and the pattern, N, on the bed, C, on which pattern the outer part of the lever, K, rests, all being arranged to operate substantially as and for the purpose herein set forth.

This invention relates to a new and useful attachment for turning lathes, whereby beads and similar ornaments may be turned or formed on sticks or other articles centered in the lathe. the device being self-feeding and capable of being applied to any ordinary turning lathe.]

42,251.—Mold for making Castings.—S. A. Corser, Northampton, Mass., assignor to himself, R. G. Marsh Holyoke, Mass., W. R. Marsh, Northampton, Mass., John A. Sims, Greenfield, Mass. Ante-dated March 28, 1864:

I claim the mold, as constructed, with a mechanism for lowering the pattern relatively to the flask and as provided with one or more sand-receiving grooves or recesses and discharging outlets arranged in the base of the mold, substantially as specified.

42,252.—Sap Conductor.—C. S. Curtis (assignor to himself and L. B. Wolcott), Farmington, Ohio:

I claim a metallic sap conductor having an entire oblique lip, A', plug, C, channel, C', and conductor, B, the several parts being constructed and arranged as and for the purpose specified.

42,253.—Telegraph Register.—Robert Henning (assignor to J. D. Caton), Ottawa, Ill.:

I claim, first, In combination with the many-grooved roller, B, employed to support the paper against the pen or style, a, the pen-holder, D, attached adjustably to head, C', so as to adapt the pen, a, to be moved longitudinally in respect to the roller, B, substantially as and for the purposes herein described.

Second, The movable pen-holder, D, provided with a series of holes, i i, and the spring bolt, j, or its equivalent, combined with the lever and the many-grooved roller, substantially as and for the purpose herein set forth.

42,254.—Carpet-cleaning Machine.—W. H. Jordan (assignor to himself and T. Jordan), New York City:

I claim, first, The employment or use of a series of flails or beaters, E, attached through the medium of disks, D, or their equivalents, to a rotating shaft, B, and arranged in relation with the carpet, E', to operate in the manner as and for the purpose herein set forth.

Second, The yielding or elastic cords, G, applied to the framing, A, and arranged in relation with the flails or beaters, E, substantially as and for the purpose specified.

[This invention consists in the employment of a series of revolving flails or beaters, arranged in a novel way and used with yielding cords and rollers, the latter having the carpet to be operated upon adjusted around them, all the parts being so arranged that by the turning of a simple shaft, the flails or beaters will be rotated and made to act upon the carpet while the latter is moved past the former, so that the whole of the carpet will be subjected to the action of the beaters.]

42,255.—Harvester.—W. A. Kirby (assignor to himself and D. M. Osborne), Auburn, N. Y.:

I claim, first, In combination with a stud or pin, n, upon the plate or lever, A, the hinged and slotted arc, N, upon the main frame, for the purpose of suspending the main frame to the plate or lever, at a higher or lower elevation as may be desired, substantially as described.

I also claim, in combination with the lever, A, stud and arc, the lever, R, by which the driver from his seat may raise up, fasten up, or let down the main frame and cutting apparatus, substantially as described.

42,256.—Vapor Stove.—C. B. Loveless, Syracuse, N. Y., assignor to O. F. Morrill, Chelsea, Mass.:

I claim, first, The stove, K, and chamber, H, constructed, arranged and operating substantially as above described, in combination with the independently-acting valve rod, c, and gas cock, G.

Second, The valve rod, c, passing through the reservoir and conduit into the vaporizing or retort pipe, constructed, arranged and operating as set forth.

42,257.—Mode of pulverizing and preparing for use Coal, &c.—J. E. Lundgrew, Stockholm, Sweden, assignor to himself and C. E. Habicht, New York City:

I claim, first, The method herein described of pulverizing to any given degree of fineness, vegetable, mineral or animal substances of a friable nature or substances capable of being reduced to powder by means of balls or the mechanical equivalent thereof in motion, in cylinders revolving upon their axes.

Second, The production of a substitute for lampblack and other similar carbonaceous matter in its various applications in the arts, by pulverizing in the manner referred to an impalpable powder, animal, vegetable or mineral coal.

Third, The production of new articles of manufacture in which coal, pulverized as referred to, is used in lieu of lampblack and other impalpable carbonaceous matter, as one of the ingredients.

42,258.—Gang Plow.—Robert Nation, Chebanse, Ill., assignor to himself and James N. Orr:

I claim the combination and arrangement in a gang plow, of the plow beams, D D, the guides, F F, provided with the slots, a a, the axle, H, provided with the slots, s s, the chains, e e, the roller, R, and lever, l, all constructed and operating as and for the purposes herein delineated and set forth.

42,259.—Washing Machine.—Nathaniel Otis, Chicago, Ill., assignor to himself and Joseph Fanyou:

I claim the combination and arrangement of the beater, F, when provided with the peculiarly-constructed grooves, herein described, with the perforated block provided with the inclined face, all arranged, constructed and operating, as and for the purposes specified and shown.

42,260.—Card-holder.—L. A. Roberts (assignor to Louis Prang), Boston, Mass.:

I claim my improved paper, as made with one or more recesses and with slits arranged relatively to such recess or recesses, substantially in manner and for the purpose specified.

42,261.—Foot Stove.—John Thompson (assignor to E. N. Colt), Brooklyn, N. Y.:

I claim, first, A T-shaped warming pan, a b, with or without air chambers, e h, as set forth.

Second, I claim the combination of the horizontal air chamber, e, and vertical air chamber, h, with the T-shaped reservoir, a b, substantially as specified.

[This invention consists in the application to a warming pan of an air chamber with perforated or solid sides, in such a manner that the feet or other parts of the body can be warmed without coming in direct contact with the surface of the pan; also in a warming pan constructed in the shape of a T, so that in placing the feet on the two horizontal wings of the pan, the vertical wing extends up between the legs, and the beneficial effect of the pan is extended over a larger portion of the body than with warming pans of the usual construction.]

42,262.—Lamp.—William Webb (assignor to the Scoville Manufacturing Co.), Waterbury, Conn.:

I claim the combination of the deflector, A, perforated base, B, and imperforate shield, B', constructed and applied as herein shown and described and for the purpose specified.

[This invention consists in having the slot of the cone or deflector of the burner extended horizontally at each end, whereby the size and brilliancy of the flame is very materially increased. The invention also consists in using, in connection with the slot formed as stated, a series of openings arranged in such a manner as to obviate the conducting of heat from the flame down to the lamp.]

RE-ISSUES.

1,649.—Machine for surface-sizing Fibrous Material.—Wm. Fuzzard and James Hatch, Malden, Mass., assignees of said Wm. Fuzzard. Patented January 12, 1864:

We claim the employment or use of a heated metallic cylinder, B, or one having a metallic exterior or periphery, in combination with a heated pressure cylinder, one or more, and a polishing roller, G, or its equivalent, arranged as shown, for the purpose of surfacing and drying, simultaneously or at one operation, fibrous materials, as set forth.

We further claim the distributing or throwing of the glazing or sizing upon or against the cylinder, or upon or against a web without a cylinder, by means of a brush, substantially as set forth.

1,650.—Hand-cuff.—George W. Reed (assignor to W. V. Adams), New York City. Patented June 17, 1862:

I claim, first, A hand-cuff or shackle composed of the two sections, A and B, hinged together and constructed substantially as described, and provided with the lock, C, or its equivalent.

Second, In combination with the shackle, as above described, I also claim the clevis or staple, substantially as set forth.

1,651.—Apparatus for saving Silver, &c., from Waste Solutions.—Jehyleman Shaw, Bridgeport, Conn. Patented July 8, 1862:

I claim, first, The employment or use either in combination with the basin or sink, into which persons using solutions of gold or silver suffer them to be wasted, or in place of said sink or basin, of a vessel, A, so arranged in combination with a bag, C, or its equivalent, that the waste solutions in running through said vessel, shall be brought in contact with such chemicals or metals which will cause the whole or any part of the silver or gold contained in said solutions to be precipitated and retained in said vessel, while the worthless material is allowed to escape.

Second, The use of the partition, B, in the vessel or sink, A, which serves to collect the waste solutions containing gold or silver, substantially as herein described so that the silver or gold is forced down to the bottom and prevented from being carried off by the current of the liquid.

Third, The filter, D, applied in combination with the vessel or sink, A, in which the waste solutions collect, substantially in the manner set forth so that said filter will retain such particles of silver or gold which may still be kept in suspension in the liquid.

DESIGNS.

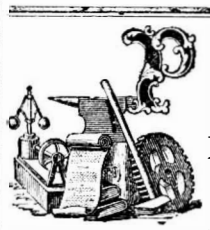
1,927.—Oil Can.—H. Everett, Philadelphia, Pa.:

1,928.—Floor-cloth Pattern.—George Green, Wappingers' Creek, N. Y., assignor to Deborah Powers, Albert E. Powers & Nathaniel B. Powers, Lansingburgh, N. Y.:

1,929.—Screen.—James L. Jackson, New York City:

1,930.—Revolving Pistol Handle.—Daniel Moore, Brooklyn, N. Y.:

1,931.—Floor-cloth Pattern.—James Paterson, Ellzabethtown, N. J., assignor to Edward Harvey, Brooklyn, N. Y.:



PATENTS

GRANTED

FOR SEVENTEEN YEARS!

MUNN & COMPANY,

In connection with the publication of [the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents:—

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter:

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D. BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar

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invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F. and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No. 37 Park Row, New York.

Notes and Queries

D. B., of Ill.—The first thing to be done is to have your alleged infringer's plow examined and compared with the claims in your Letters Patent by a patent lawyer, and if the parties are infringing your claims it will be his duty to warn them of the infringement and summon them to appear and pay damages for infringing, buy a license and stop manufacturing; and if they do not regard your threat, get out an injunction to restrain them.

J. L., of N. Y.—Petroleum is a mixture of various hydro-carbons, and probably no two specimens have the several chemical compounds mixed in the same proportion. In the process of purification the more volatile substances are separated, and these are called benzine. As benzine is composed of a number of hydro-carbons mixed in various samples in different proportions, there is no fixed boiling point common to all the samples.

O. H. K., of N. Y.—Sulphate of soda may be decomposed by carbonate of lime and charcoal with intense heat, but your best plan will be to buy a pure article.

C. H. P., of Mass.—Articles of iron may be covered with copper by dipping them in a solution of sulphate of copper.

D. R., of R. I.—It is our opinion that very few of our readers are interested in the discussion of questions in pure mathematics.

F. A. W., of Mass.—King's "Notes on the Steam Engine" is a very useful and practical book for engineers.

P. S., of Pa.—We do not know of any machine in the market capable of dropping potatoes.

W. A. V., of N. H.—You can have the powder which you send us analyzed for $15.

F. T., of N. Y.—Butter is one of the organic products that has never been produced by art.

C. R. W., of Ind.—We are informed by Prof. Seely that there are no stereomonoscopes yet for sale in market.

T. J. F., of Texas.—There are no two liquids known which will ignite by simply being brought in contact. There are liquids which on being brought in contact with certain solids will generate sufficient heat to create flame. Water poured on lime in sufficient quantity will set wood on fire.

A. W. H., of N. Y.—Aluminum bronze is an alloy of 90 parts of copper with 10 of aluminum. You can get aluminum of J. F. Luhme & Co., 556 Broadway, this city, and perhaps aluminum bronze and Aich metal.

Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, April 6, 1864, to Wednesday, April 13, 1864 :—

R. A. V., of N. Y., $25; J. F. C., of N. Y., $50; E. T. S., of N. Y., $20; F. S. G., of N. Y , $16; A. E. H., of N. Y., $45; E. S. H., of N. J., $20; W. G., of Ind., $20; A. O., of N. J., $16; J. D., of Canada, $12; H. D., of Ohio, $45; J. W., of N. Y., $16; O. W., of N. Y., $20; J. F., of N. J., $16; L. G. K., of Mass., $16; R. B. W., of Ohio, $25; A. I. A., of Ill., $16; S. & T., of Ohio, $20; C. B., of Ind., $50; P. & B., of Pa., $25; E. R. B., of Ind., $15; J. G., of Pa., $20; O. W. & B., of Ill., $16; G. C. P., of Cal., $40; G. H. M., of Ohio, $20; A. C. K., of Wis., $28; W. P., of Ark., $26; A. W. T., of Ill., $50; M. J. D., of Ohio, $10; T. K. M., of Conn., $16; W. M., of Mass., $16; E. A. P., of Mass., $30; H. A. A., of N. Y., $20; B. M., of N. Y., $25; G. W. B., of N. Y., $41; W. M., of N. Y., $16; J. S., of N. Y., $16; J. B., of N. Y., $16; C. A. S., of N. Y., $41; C. St. J., of Mass., $45; H. McK., of Ill., $16; E. G. R., of Mich., $20; D. S., of Cal., $32; W. B. V., of Pa., $20; T. R., of N. Y., $20; J. B. K., of Ill., $16; H. L., of Minn., $25; A. M. W., of Mass., $16; F. A. B., of N. Y., $16; C. A. W., of Vt., $25; D. & M., of Ill., $25; E. H., of Minn., $16; H. C. S., of Mass., $16; E. R. C., of N J., $25; J. H., of Conn., $44; E. K., of N. Y., $16; D. & B., of N. Y., $25; D. E., of Ill., $25; W. N. S., of Ill., $25; W. D. S., of N. Y., $25; J. H., of Wis., $15; J. A. M., of Ill., $15; J. D., of Ill., $10; C. H., of Ill., $16; J. T., of Ind., $20; W. F. S., of N. Y., $41; J. P., of N. Y., $20; I. C., of Mo., $20; B. & S., of N. J., $16; J. F., of N. Y., $16; W. L., of Md., $100; I. S., of N. Y., $20; C. H. R., of N. Y., $16; J. K. U., of N. Y., $16; N. A., of Ohio, $20; B. & G., of Conn., $20; C. W. B., of Conn., $59; J. R. P., of Ohio, $25; A. H., of Ky., $16; H. & F. B., of Ohio, $32; H. T. S., of Mass., $12; W. C. G., of N. Y., $25; J. M., of Mass., $30; W. R. F., of Cal., $20; H. H., of Mass., $16; G. H., of Cal., $15; W. P., of Md., $15; J. H. P., of Mo., $16; W. C. N., of Conn., $25; F. J. R., of Ill., $15; N. & J. C., of Ill., $10; L. D. C., of Mich., $20; C. M., of Mass., $16; P. D., of N. Y., $16; L. B. B., of Ill., $17; A. J. F., of Vt., $20; H. L., of N. Y., $56; J. F., of N. Y., $25; J. S., of N. Y., $25; A. J. C., of N. Y., $25; H. McK., of Ill., $25; J. F. C., of N. Y., $181; P. A. C., of Ind., $30; J. T. P., of Ind., $30; J. J. R., of Ohio, $20; J. E. G., of England, $16; T. A. G., of Ill., $16; C. & P., of N. Y., $16; S. L. O., of Conn., $16.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, April 6, 1864, to Wednesday, April 13, 1864 :—

R. A. V., of N. Y.; B. M., of N. Y.; A. S. L., of N. Y.; G. W. B., of N. Y.; W. F. S., of N. Y.; E. R. C., of N. J.; C. A. W., of Vt.; W. C. G., of N. Y.; R. B., of N. Y.; R. B. W., of Ohio; W. P., of U. S. A.; D. E., of Ill.; T. J. E., of Ind.; H. T. S., of Mass.; J. R. P., of Ohio; P. & B., of Pa.; C. B., of Ind.; J. M., of Mass.; G. C. W., of Ohio; H. & R., of Pa.; H. L., of Minn.; D. & B., of N. Y.; R. W., of N. Y.; O. E. W., of Pa.; H. L., of Ky.; A. C. K., of Wis.; J. S., of Iowa; W. D. S., of N. J.; W. N. S., of Ill.; N. & J. C., of Ill.; A. W. T., of Ill.; W. C. N., of Conn.; J. H. H., of Conn.; D. & M., of Ill.; G. W. B., of Ohio; J. F. C., of N. Y., (5 cases); H. McK., of Ill.; J. F., of N. Y.; H. L., of N. Y.; H. A. A., of N. Y.; A. J. C., of N. Y.; J. S., of N. Y.; J. F., of Conn.; C. W., of Iowa; E. A. P., of Mass.; J. T. P., of Ind.; P. A. C., of Mass.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

BAIRD'S NEW AND REVISED CATALOGUE OF Practical and Scientific Books, complete to April 12, and fuller than any he has heretofore published, is now ready for delivery. He will send it free of postage to any reader of the SCIENTIFIC AMERICAN who will favor him with his address. In it will be found many new books of great interest and value just ready or in preparation.
HENRY CAREY BAIRD,
Industrial Publisher, 406 Walnut street, Philadelphia.

ARMY CLOTHING AND EQUIPAGE OFFICE,
Cincinnati, Ohio, April 6, 1864.

PROPOSALS ARE INVITED BY THE UNDERSIGNED, until WEDNESDAY, April 20th, 1864, at 12 o'clock, M., for furnishing this Department (by contract) with—,

Blankets—Woolen	Army Standard.
Camp Kettles,	do.
Color Belts,	do.
Drums—complete	do.
Felling Axes (first quality only and to weigh from 4¼ to 5¼ lbs.)	do.
Felling Ax Handles,	do.
Guidons (Cavalry)	do.
Kersey, Sky-blue,	do.
Pick Axes,	do.
Pick-ax Handles,	do.
Spades,	do.
Shelter Tents,	do.

Samples of which may be seen at the Office of Clothing and Equipage in this city.

To be delivered, free of charge, at the U. S. Inspection Warehouse, in this city, in good new packages, with the name of the party furnishing, the kind and quantity of goods distinctly marked on each article and package.

Parties furnishing goods must in all cases furnish samples, marked and numbered to correspond with their proposal, and distinctly state in their bids the quantity of goods they propose to furnish, the price and the time of delivery.

A guaranty, signed by two responsible persons, must accompany each bid, guaranteeing that the bidder will supply the articles awarded to him under his proposal.

Bids will be opened on Thursday, April 20, 1864, at two o'clock, P. M., at this office, and bidders are expected to be present.

Awards will be made on Saturday, April 21st.

Bonds will be required that the contracts will be faithfully fulfilled.

Telegrams relating to proposals will not be noticed.

Blank forms of proposals may be obtained at this office.

The right to reject any bid deemed unreasonable is reserved.

By order of Col. Thomas Swords, A. Q. M. G.

1 G. W. MOULTON, Captain and A. Q. M.

ARMY SUPPLIES.

OFFICE OF ARMY CLOTHING AND EQUIPAGE,
502 BROADWAY, NEW YORK, April 7th, 1864.

SEALED PROPOSALS WILL BE RECEIVED AT this Office until 12 o'clock, M., on Thursday the 14th instant, for furnishing by contract, at the Depot of Army Clothing and Equipage in this city,

SIX-MULE-WAGON HARNESS, COMPLETE,

Specifications for which can be seen at this Office. Bidders will state the quantity they wish to supply, and the shortest time in which they can deliver it.

All proposals must be accompanied by a proper guarantee for the faithful performance of a contract.

The United States reserves the right to reject all bids deemed objectionable.

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Improved Plan for constructing Ships.

Notwithstanding the present great difficulties experienced in keeping the bottoms of iron vessels clean, and protecting the iron plates against corrosion, ships of that description are increasing in number every year, showing that they have advantages over wooden vessels of such importance that, if these difficulties could be overcome, iron ships would entirely supersede the wooden ones, at least with regard to vessels of war, large ocean-going steamers, and sailing vessels. Many experiments have been tried with different kinds of paints and coatings to protect iron plates against accumulating dirt and rust; but as yet without any promising result.

It is therefore obvious that the use of iron as a material in ship-building should be confined to places where moisture cannot injure it, and yet have its great quality—strength—applied to the best advantage.

The mode of construction proposed by the inventor is to combine iron and wood together in such a manner that the iron forms the inner and principal structure, and is strengthened and protected by a water-tight wooden casing outside.

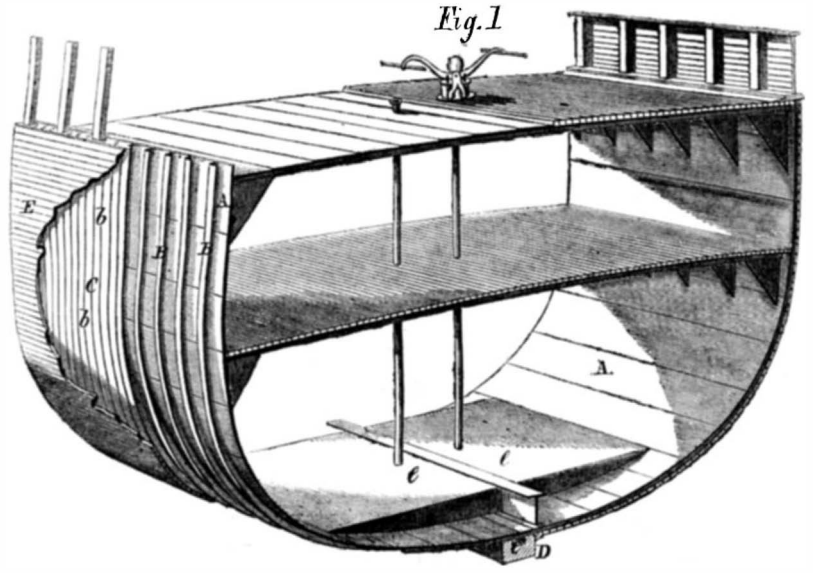
A represents the iron shell of the vessel, which is riveted together in the usual manner, and fastened with bolts and nuts on frames temporarily put up inside, so that the whole iron shell may be shaped to its proper form before the outside frames, B, are fastened to the plating, A. The frames, B, are made of angle iron with flanges on the inside only, or with flanges inside and outside, which latter shape, in most cases, will be preferable. The spaces between the frames, 16 to 18 inches, are fitted in with timbers, C. This filling consists of two timbers between each frame, bolted to the frame and to each other as at *a*, in Fig. 2. The timbers will be fitted to the frames and bored before these are fastened in their places. The two mid-ship frames are to be reversed and bolted together on the ground, with the filling timbers between them; in this way the inside flanges will on one frame show forward, and on the other side show aft; the flanges being riveted to the plating the next timber on each side should be bolted to these frames, and this done, the second frame with its corresponding timber should be secured as the first, *a s f*. By this proceeding there will always be ample room for driving the bolts. The temporary frames must be removed in succession as the outside ones are put up, and the same holes in the plating used for both.

A space of about $\frac{1}{4}$ of an inch should be left between the inner surface of the timbers and the outer surface of the plating. This space will be filled with soft pitch to a hight of some feet over the turn of the bilge, said pitch to be poured in hot through holes bored in the timbers at convenient intervals, and the holes afterwards plugged with treenails. The space above this line can be filled with felt saturated with coal tar. The timber-filling extends beyond the outer flanges or edges of the frames, is dovetailed and calked in the seams. A groove, *b*, is cut in each seam as shown in Figs. 1 and 2. These grooves will be cut, before the seams are calked, about 1 inch deep and 2 inches wide, they lead down to a channel, *c*, cut out in the bottom of the timbers, C, and in the keel, D, as far as practicable, extending throughout the entire length of the vessel.

From this channel, pipes of copper or other suitable material extend to a cistern, *e*, placed in the bottom of the ship, and having attached to it a pump, by the action of which the water as well as foul air accumulating in said cistern can be removed whenever it may be necessary.

To the outside of the timbers, C, a planking, E, is fastened by composition nails and calked. Any water or moisture which may find its way through the seams

Fig. 1



HEIN'S PLAN FOR CONSTRUCTING SHIPS.

of the planking will pass through the grooves, *b*, down to the channel, *c*, and thence to the cistern, *e*, where it will be removed by the pump. By this arrangement it will be seen that no water can accumulate in the hold of the vessel under ordinary circumstances, as it has to pass first through the calking of the timbers, then through the pitch between them and

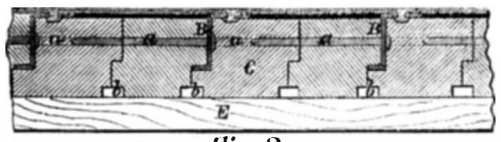
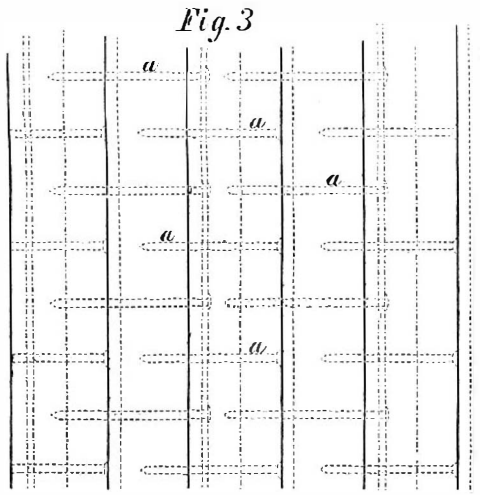


Fig. 2

the plating, and lastly through the calked seams in the plating. The interior of the vessel has, besides this advantage, that of being perfectly smooth, with no obstructions whatever to applying water-tight bulkheads fore and aft, which in ordinary vessels is attended with considerable difficulty. It can be painted and kept clean with the greatest facility, and the cargo is not liable to be damaged by bilge water. There can be no injurious effect from acids distilled

Fig. 3



from the wood on the plating outside, as the wood is separated from it by the pitch and coal-charred felt, and besides this the grooves carry off the water as before mentioned. The bottom can be coppered like that of a wooden vessel, no galvanic current affecting the iron.

The iron shell inside will make the vessel comparatively safe against fire. It will be seen by this that a vessel built on the plan here shown will combine the good qualities of iron vessels with those of wooden ones. The first cost will be greater than that of other vessels, but it will outlast them twice and insure at a low rate, so it will amply repay the excess of the first outlay.

Applied to war vessels this construction is superior to any now used, as the thickness of timber outside can be increased to any dimension and the armor plates bolted on it. The deck will in this case have to be built like the sides of the vessel, the iron frames and plating extending all around, making the hull perfectly water-tight even if loaded down to within an inch of the deck. Even merchant vessels of this description can, at a short notice, be altered into formidable war vessels, and a fleet of ocean-going steamers built as here mentioned would, in case of war, prove to be a valuable defense for the country that owns them. For further information address Louis Hein, care of P. O. Baker, 87 Wall street, New York.

A FEW days ago the steamer *Missionary*, on the Cumberland river, had her flues blown out, and suspicions led to the examination of the wood, which resulted in the discovery of several pieces containing infernal machines.

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